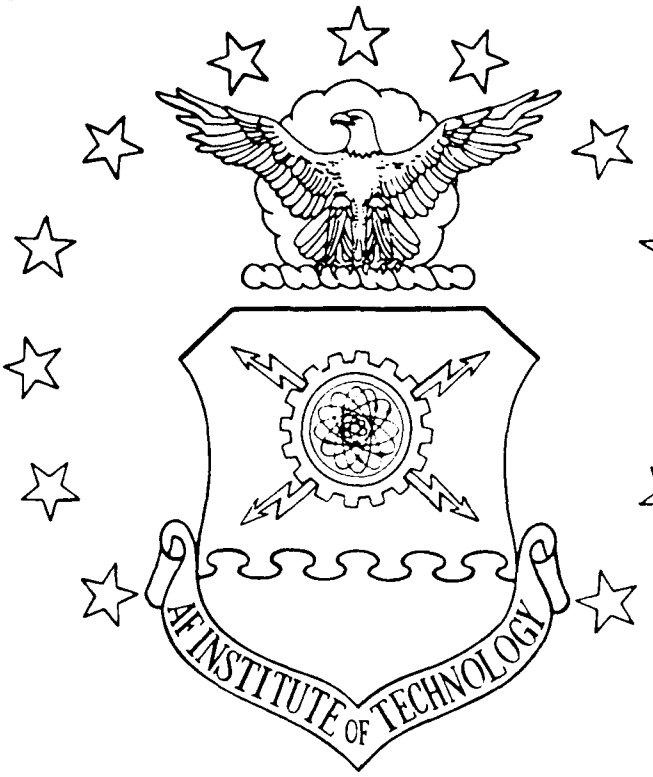

EMPOWERMENT: A STRATEGY FOR INCREASED QUALITY IN AIR FORCE LOGISTICS COMMAND

THESIS

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AFIT/GLM/LSR/89S-36

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THESIS

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the

Requirements for the Degree of

Master of Science in Acquisition Logistics

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September 1989

Acknowledgements

Dedications and literary expression of gratitude tend to be either pompous or tremendously understated. Certainly, this is an instance of the latter. In conducting this study I am deeply indebted to my advisor, Maj Ken Jennings, for his unwavering support, and incisive guidance. Mssrs Mike Foran and Joe Day of the QP shop at Newark AFB performed a tremendous service in not only getting the survey out and collected and in making the research design a reality, but in helping prepare this document and making me conversant with the intervention. I would also like to thank Col Flournoy for permission to conduct this survey at Newark, as well as each participant who took the considerable amount of time necessary to fill it out. I must also thank my three children, Matthew, Megan and Manda for tolerating their father's prolonged absences and their mother's perpetual exhortations to "let Daddy work." Finally, I would like to thank my wife Sue. She spent a year and a half looking at the back of my head while I completed this project, I just hope she thinks it was worth it.

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Abstract

The purpose of this study was to develop both an analytical model describing, and an instrument to measure, the behavioral construct empowerment. The pressing importance of such a model and an instrument to measure this construct, is evident in AFLC's Quality Initiative and in the more widespread perception that American management must change dramatically to restore, or at least regain, the favorable reputation American products and services once enjoyed both at home and abroad.

The study provides a brief background on the concepts of self-efficacy and empowerment, detailing their evolution in the psychological and managerial literature. Next follows a proposed model of the empowerment process and an instrument to test the model and measure levels of empowerment among a firm's employees. A discussion of the reliability and validity of both the instrument and the model follows, with attendant analysis of results and conclusions. The study closes with recommended managerial actions to further increase empowerment among an organization's employees.

EMPOWERMENT: A STRATEGY FOR INCREASED QUALITY IN AIR FORCE LOGISTICS COMMAND

I. Introduction

General Issue

Quality, a major determinant of consumer preferences (Garvin, 1986:653), is receiving increased emphasis within the military services, and particularly in the U.S. Air Force Logistics Command (AFLC). In its role as a consumer, the Command demands better performance from the items it purchases to support the Air Force's weapons systems; as a supplier, the Command demands better accommodation of the customers it serves. This emphasis on increased quality of products and services, evidenced as a shift in emphasis by the uppermost levels of supervision in early 1988, has precipitated revision of management's role in AFLC as an attempt to alter the organizational climate throughout the Command (Hansen, 1988a).

Comprised of five Air Logistics Centers and several smaller industrial and support organizations, AFLC is the "industrial sector" of the Air Force, responsible for the refurbishment and logistical support of aircraft and missiles. The Command is clearly an archetypical classical bureaucracy, with its attendant staff functions and hierarchical specialization of labor (Weber, 1947). In implementing AFLC's quality initiative, a clash has been engineered between an organization run largely under the guise of

"modern," "scientific" management (Taylor, 1911; Tausky,1978) and the emplacement of "Theory Z" (Ouchi, 1981), "Japanese," or "Just In Time" managerial practices.

The emphasis in AFLC on quality products/services is a departure from past practices (Hansen, 1988a). The means of assuring such quality--empowerment--is also a novel one for the U.S. military-industrial sector. With its emphasis on pushing responsibility and authority to the lowest possible levels, empowerment may be seen as a threat to t' traditional, rigid, hierarchical structure commonly associated with a bureaucracy (Kanter, 1983). More than this threat, however, there are three primary reasons for examining empowerment in the military-industrial setting. First, current military strategy in the United States relies on weapon quality, not quantity; we rely on numerically fewer, but technologically advanced (and expensive) weapons systems to meet the enemy threat (R&M 2000, 1987:1; Hansen, 1988c). This strategy is predicated on the assumption that our weapons systems will not only function when needed, they will perform as expected. Such weapons systems must be reliable and maintainable--a blending of Garvin's product- and user-based definitions of quality (1984). Thus, quality has become an essential element of combat readiness. Secondly, the military has a moral, as well as legal, obligation to provide the taxpayer with the most defense for his defense dollar (see Thomas Paine--Fast, 1943:178-183). This is particularly true in light of the blossoming federal deficit and looming cuts in Defense expenditures. It is therefore incumbent on the Services to procure the best and most capable weapons systems, ensuring that defense dollars are spent as wisely as

possible. (See Garvin's value-based definition of quality,1984.) Finally, quality is necessary in the military-industrial complex to keep pace with foreign competition. Migration of emerging technologies and "high-tech" industries may threaten the nation's economic self-sufficiency, particularly defensive capabilities. Production of high quality parts at economically realistic prices has come to be a major consideration in the ongoing evolution and support of weapons systems. In General Hansen's words, "Shifting national priorities, intense international competition, and a very dangerous world situation are all sending us a clear and unmistakable message: Improve the quality of our processes across the board, or be left behind" (1988b).

With the rise of quality as the current American organizational mantra, the necessity for a sweeping change in management philosophy among American firms has become even more evident. Many American businesses, seeking to compete with Japanese industries, are adopting a "me too" attitude, embracing Just in Time production techniques and statistical process control (Garvin, 1986:656). Matsushita's favorable experience with U.S. workers manufacturing high quality, reliable television sets in the United States (Chase and Aquilano, 1989:737-739), is but a single example belying the litany that the superior quality of Japanese products is due to homogeneous Japanese culture, or superior Japanese labor. What is evident, is that Japanese managerial philosophy, with its emphasis on the manufacturing process and on labor relations, may well be the critical determinant in producing quality American products for the domestic and world markets (Garvin, 1986). The key tenet of the Japanese emphasis on

labor relations (much broader in scope than the typical American context) is not paternalism--rather, expressed in managerial/behavioral terms--it is the concept of empowerment.

Problem Statement

The development of an organizational culture that makes continual, incremental change not only possible, but part of the organization's cultural fabric, has, as an integral element, the devising of a strategy to increase the overall level of quality in the services and products of that organization (Jennings, 1988). Employees must be made stakeholders in the production and services provided by an organization, as well as its general welfare. Garvin's 1984 study exploring the relationship between quality, organizational policies and goals among American and Japanese first-line supervisors clearly illustrates the strong commitment to quality necessary on behalf of both management and workers, if a firm is to produce first rate products. The study also highlighted the differences in Japanese and American managerial philosophy, clearly indicating that corporate initiatives to improve quality depend on empowering workers.

The following research proposes the construction and validation of an empowerment model and a research instrument to determine antecedents/predictors and levels of empowerment. The research was conducted at two geographically separate U.S. Air Force organizations, one a staff oriented organization with no formal intervention program, the other a production facility with an intervention nearing completion of its initial

stages. The following questions provide a logical basis for examining the specific problem:

1. What managerial strategies and techniques are managers using to empower employees?
2. Which of these managerial strategies and techniques used to empower workers are most effective?
3. What are the organizational factors (organizational structure, supervision, reward system, job design) most strongly correlated with empowerment?
4. How are organizational factors and empowerment related?
5. How empowered are employees, both in absolute terms and relative to each other? Do particular work centers within an organization have better (more successful) empowerment strategies than others? What managerial and organizational factors account for these differences?

Proposition

The collective magnitude of the path coefficients for the causal model analyzed after the intervention is significantly greater than that analyzed with control data (no QP4 training). The outcome oriented hypotheses follow:

(H1) Employees that have received QP-4 training are more empowered than controls. The rating dimensions include decentralization of decision making, increased employee responsibility, decreased powerlessness with regard to the individual's job, increased perceptions of personal ability and power over one's immediate task/job.

(H2) Empowered employees:

(H2A) Have clearer goals than controls.

(H2B) Set more difficult goals than controls.

(H2C) Have increased knowledge of results of their actions.

(H2D) As a result of setting higher goals, experience greater job challenge than those persons in control groups

(H3) More highly empowered employees participate more in decision making (regarding their work and the work environment) than do controls.

(H4) The next set of variables, identified from the theoretical literature, deal with the characteristics of the job an individual performs. More highly empowered workers report:

(H4A) Greater freedom in determining how to perform a job and what gets done.

(H4B) Greater variety in the tasks making up their jobs.

(H4C) More task feedback, indicating how well an individual is performing.

(H4D) Increased task completeness--the degree to which an individual produces an entire service/product.

(H4E) Better visibility of results to the worker himself.

(H4F) Greater significance and importance of work performed.

(H4G) More skills required to perform the job.

(H4H) More adequate training.

(H5) The following hypotheses deal with expectancy-motivation theory

(H5A) More highly empowered persons see their work organization as more supportive of creativity than do controls.

(H5B) More highly empowered members perceive that they have more training than do controls and possess the skills adequate to perform job related tasks.

(H5C) Empowered persons see fewer obstacles and constraints to performance than controls.

(H5D) Empowered individuals rate the probability of receiving a reward, based on a given level of performance, more likely than their less-empowered cohorts.

(H6) The following hypotheses deal with self-efficacy

(H6A) Empowered workers show a greater reliance on past performance than less empowered workers in assessing their ability to perform a new task.

(H6B) Empowered employees have more vicarious experiences than do controls.

(H6C) Empowered individuals get more information concerning personal competency arising from stressful and taxing situations than less empowered persons.

(H6D) Empowered individuals believe more strongly, because of suggestion, that they can cope successfully with what has overwhelmed them in the past, than do controls.

Table 1 represents a summary of the dependent variables expected to be impacted by the intervention and the expected direction of change.

Table 1. Expected Direction of Variable Change

Goal Setting

Goal clarity	(+)
Goal difficulty	(+)
Knowledge of results	(+)
Job Challenge	(+)

Participation in Decision Making (+)

Job Characteristics

Freedom	(+)
Variety	(+)
Task completeness	(+)
Task importance	(+)
Task significance	(+)
Required skills	(+)
Training adequacy	(+)

Expectancy

Rewards	(+)
Support for creativity	(+)
Skills & adequacy training	(+)
Effort/Outcome probability	(+)
Performance obstacles/constraints	(+)

Table 1. (Continued)

Self-efficacy	
Past performance	(+)
Modeling	(+)
Emotional arousal	(+)
Persuasion	(+)
Empowerment	(+)

Delimitations of the Research

This study is a cross-sectional analysis of empowerment strategies and levels--a "snap shot" of the varying degrees of success enjoyed in empowering workers at two military sites. The study is intended to be the baseline for other longitudinal studies made in this context. Unfortunately, for purposes of this study, intervention was begun in April 1988, prior to the author's development of an instrument to measure empowerment. Hence, no pre-experiment measures are available. While acknowledging that such a sweeping change in managerial practice as is entailed by QP4 (AFLC's "quality" initiative) is likely to cause some contamination among subjects not directly involved in the intervention, it was none the less decided to assess the relevant variables between QP4 trained and non-trained individuals, in an attempt to compensate for the lack of a pre-intervention attitudinal baseline. Due to time, fiscal and personnel constraints, the author was unable to perform a longitudinal study of the intervention. Within these constraints, the ultimate purpose of this study was to determine relative levels of change in empowerment, seeking to identify successful empowering strategies (managerial and organizational factors) for further study and possible use by AFLC managers.

No attempt is made in this study to determine the absolute increases in quality of products or services produced as a result of the QP4 intervention. Because of the variety of ways in which quality may be defined, such measurement is clearly beyond the scope of this research (Garvin, 1986). Rather, this study is limited to identifying successful strategies for detecting levels of, and increasing, empowerment.

Abbreviations Used in this Study

AFIT: Air Force Institute of Technology. The "graduate school of the Air Force," established to meet Air Force scientific and technological requirements. Degree-level and continuing professional education in technical areas are offered both through AFIT's accredited graduate school at Wright-Patterson AFB, Ohio, and through civilian universities throughout the country.

AFLC: United States Air Force Air Logistics Command. The mission of AFLC is to keep the US Air Force's aerospace weapon systems, wherever deployed in the world, in a constant state of combat readiness. Its task is to provide the logistics management needed to keep the Air Force's aircraft missiles, and support equipment in top condition. The command supports all Air National Guard, U.S. Air Force Reserve, other U.S. government agencies and air forces of friendly nations (AFLCP 66-65,1987:i).

ALC: Air Logistics Center. AFLC is divided into five ALCs, each a highly complex "corporation," supporting all worldwide customers for particular services and products. Each ALC is assigned particular aircraft, subsystems and support equipment for logistic support. Additionally, various other locations have been identified to support special activities such as aircraft reclamation and regeneration, and contract monitoring.

MOAQ: The Michigan Organizational Assessment Questionnaire. A survey designed to provide information about the perceptions of organizational members, both objective and subjective, regarding work, the work environment and organizational structure (Cammann, et. al., 1975).

QP4: "Quality is people, process, product and performance." A process of controlled change, combining participative management, statistical process controls, emphasis on communication and teamwork, to improve the quality of product or services and increase productivity within an organization (ITT Research, 1988:1-2).

II. Review of the Literature

The Empowerment Model

Before discussing the composition of the model of the empowerment process, we must first define the concept of empowerment:

> A process of enhancing feelings of self-efficacy among organizational members through the identification of conditions that foster powerlessness and through their removal by both formal organizational practices and informal techniques of providing efficacy information. (Conger and Kanungo, 1988:474)

As a managerial construct, the term empowerment has only recently crystallized in the management and psychology literatures with Conger and Kanungo's 1988 article, but the concepts it embodies have a substantial history. However, one other concept, self-efficacy, must be understood to grasp the notion of empowerment. The term has as its root the word efficacy, defined as "the power to produce effects" (Webster's International Dictionary, 1969:725). The psychological construct of self-efficacy takes this notion of efficacy as the power or ability to produce affects a step further, broadening the definition, and attributing to it four components. Self-efficacy is thus "the degree to which a person is enabled to accomplish a task, based on expectations derived from four principle sources of information--performance accomplishments, vicarious experience, verbal persuasion and psychological states" (Bandura, 1977:191).

Armed now with basic definitions of empowerment and self-efficacy, we can examine the model of the empowerment process proposed by

Conger and Kanungo (Figure 1). Stage I of Conger and Kanungo's model describes four factors leading to a psychological state of powerlessness (the antithesis of empowerment)--organizational factors, supervision, reward system and nature of the job--factors that conspire to diminish feelings of self-efficacy, and that must be mitigated to increase levels of empowerment in an organization.

Organizational Factors. Kanter (1979, 1983), in a continuing survey of American managerial practices across a wide spectrum of businesses ranging from the industrial to the service sectors, highlighted several factors that inhibit self-expression, autonomy, and the sharing of organizational power. Among these were a bureaucratic climate, poor communication, and aversion to corporate risk-taking. Removal or diminution of these barriers is an essential step toward diminishing powerlessness.

Supervision. Authoritarian management styles increase powerlessness among subordinates, diminishing their control and discretion. Studies by Oldham (1976), Garland (1984), Erez, Early and Hulin (1985), Earley (1985), and Earley, Wojnaroski and Prest (1987), illustrate the deleterious effect autocratic management styles can have on goal setting and performance when such a style is compared with more a more participative managerial strategy. In another study, Szilagy (1980) determined that positive leader behavior increased subordinate work performance and satisfaction, and that absenteeism and poor subordinate performance led to

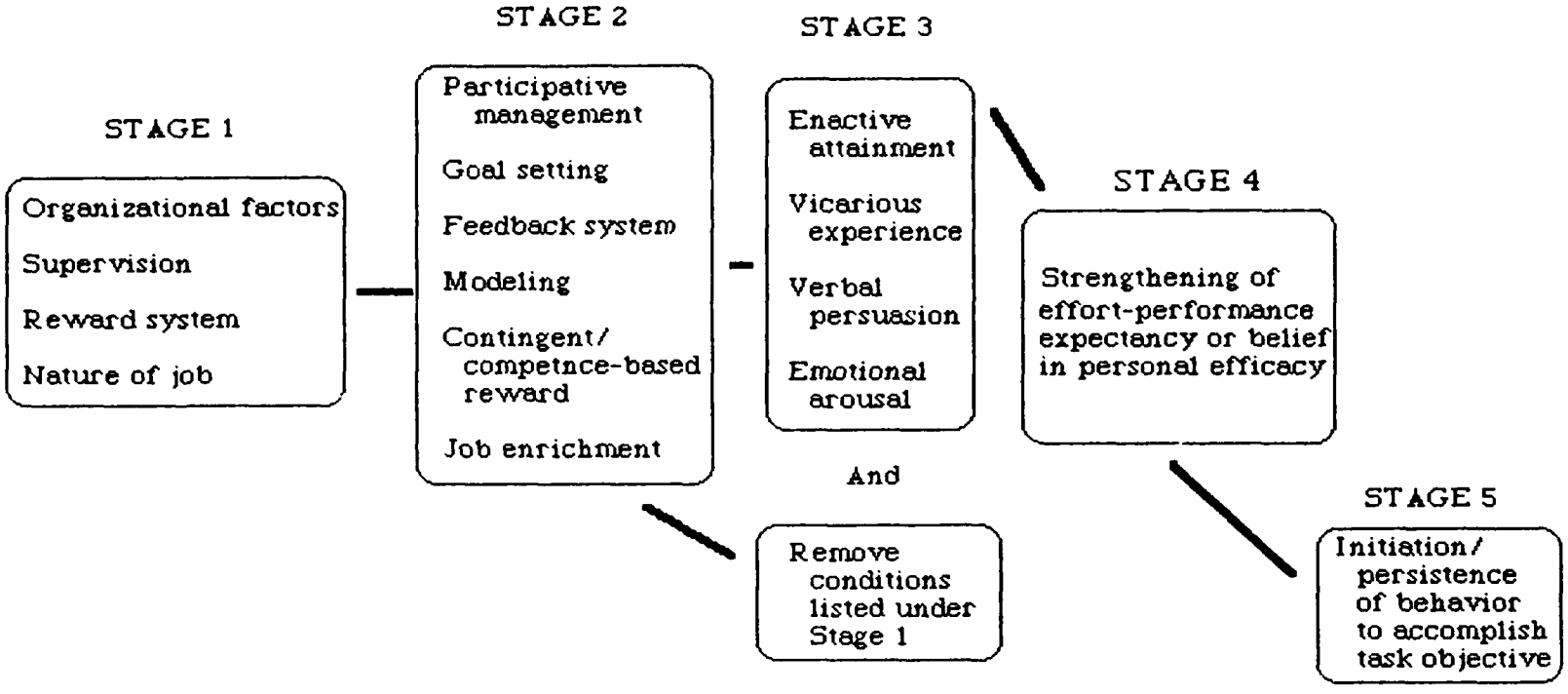

Figure 1. Model of the Empowerment Process
(Conger and Kanungo, 1988:475)

perceptions of punitive leader behavior. Supervision, in this context, is composed of managerial style (autocratic/participative), and supportive behavior.

Reward System. Vroom (1964) and Lawler (1981) determined that organizations must provide rewards that are valued by employees, and that are based on competence, initiative and innovative job behavior. Reward systems that do not reinforce the previously listed behaviors, that support other values, set up a sort of "organizational reward schizophrenia" in which employees may never be able to determine just which behaviors the organization does value, based on the cues given them by the reward system.

Nature of the Job. The basic premise is that "simple, routine, non-challenging jobs often lead to high employee dissatisfaction...and substantial difficulties in managing workers who work simplified jobs" (Hackman and Lawler, 1971:259). This factor is discussed more thoroughly in the following section.

While Stage I identifies barriers to empowerment, Stage II of the model identifies strategies and techniques managers can use to break down these barriers and decrease feelings of powerlessness among employees.

Participative Management or PDM. Giving employees the opportunity to participate in decision making. Managerial targets here include participative goal setting, provision of performance norms and other job-related information. Research conducted by Earley (1985), Erez, Earley and Hulin (1985), and Earley, Wojnaroski and Prest (1987) indicated that goal acceptance is enhanced when information about the task and the goals,

as well as choice in task strategy and degree of difficulty of the goals set, is high. Sharing of information about the task at hand, as well as normative information, results in the setting of more difficult goals and the attainment of higher levels of performance, when compared with an autocratic managerial style or situations in which goals were assigned (Garland, 1984).

Goal Setting. Clear, specific, difficult goals result in greater performance than "do your best" or no goals, but only when these goals are accepted. Prior discussion indicates that the degree of difficulty of goals set by individuals is intimately related to the managerial style employed by supervisors. The previously cited study by Erez, Earley and Hulin (1985) also discerned that groups with participatively and representationally set goals outperformed groups with assigned goals, while Erez and Zidon (1984) concluded that setting specific and difficult goals led to higher levels of performance than unspecified or less specific goals. This last study further concluded that goal acceptance levels can be modified by leader behavior, leading one to expect the conclusion reached by Earley (1985) that goal acceptance is enhanced when information and choice are at high levels; such conditions, are, in fact, necessary for, and lead to, high levels of job related performance.

Feedback System. Employees need specific knowledge of how well they are performing tasks (Erez and Zidon, 1984), of normative (peer) performance levels (Meyer and Gellatly, 1988), of available task strategies (various ways to accomplish a specific task) (Erez and Zidon, 1984), and of rewards (Latham and Mitchell, 1978), to increase their ability to perform

tasks. Managerial feedback provides these types of information to employees.

Modeling. People learn vicariously by watching others. This is one of the four methods by which feelings of self-efficacy may be directly enhanced, and is discussed further in the section dealing with self-efficacy.

Rewards. Rewards must be valued by employees, and based on competence, initiative and persistence (Vroom, 1964; Lawler, 1981). As discussed previously, a viable, coherent reward system reinforces the importance of an organization's goals among its employees. However, while rewards are important, one should note that participative goal setting alone can outweigh the effects of private or public recognition and even monetary bonuses, in enhancing goal setting and levels of performance (Latham and Mitchell, 1978).

Job Enrichment. Hackman, et. al., (1975) presented an analytical tool for assessing an individual's Motivating Potential Score (MPS), a measure of the motivating potential of a job. The MPS model was a watershed study in that it not only reliably identified five dimensions of job-related motivation--skill variety, task identity, task importance, task significance, personal responsibility and knowledge of results in an empirical formula--with it the authors also proposed five "implementing concepts" for job enrichment. These five implementing concepts--forming natural work units, combining tasks, establishing client relationships, vertical loading and opening feedback channels--provide managers specific strategies to improve motivation among employees.

While Stages I and II dealt with barriers to empowerment and their resolution--the tactics of reducing powerlessness--Stage III of the empowerment model proposes four mechanisms for providing self-efficacy information to subordinates: enactive attainment; vicarious experience; verbal persuasion and emotional arousal. These four mechanisms enable employees to attempt or accomplish tasks in the face of obstacles that would previously have deterred them from even attempting such new behavior (Bandura, 1977:193-4).

Enactive Attainment. Personal mastery experiences based on past performance, an especially influential source of efficacy information (Bandura, 1977:195). Having accomplished a difficult task makes a person feel that in the future he will be able to accomplish an even more difficult task.

Vicarious Experience. Inferences made from social comparison, seeing others perform threatening actions without adverse consequences (Bandura, 1977:197). Learning by watching others. Observing how an associate completes a particularly difficult task, the observer feels that he may be able to complete the same task also.

Verbal Persuasion. Leading people, through suggestion, into believing they can cope successfully with what has overwhelmed them in the past. A widely used efficacy method because of its ease and availability. Feelings of efficacy produced by this method are weak, however, as no authentic experiential base is provided for them. The strategy is used more to raise outcome expectancy than personal efficacy (Bandura, 1977:198).

Emotional Arousal. Information concerning personal competency arising from stressful and taxing situations (Bandura, 1977:198).

Summary. Stage III of the model is thus the removal of the adverse conditions listed in Stage I, the implementation of managerial strategies listed in Stage II, and the provision of self-efficacy information to subordinates via the four mechanisms just described. Stage IV proposes a strengthening of employee empowerment resulting from the previous three stages, while Stage V of the model is the institutionalization of the empowerment process and the ensuing corporate culture.

The Experimental Model

As the previous examination of laboratory and field studies of the psychological and managerial constructs antecedent to empowerment illustrates, the precursors and predictors of empowerment are often not easily separated from one another. Conger and Kanungo, in presenting their model, provided, for purposes of discussion, an artificial separation among many factors that are closely related both in the theoretical literature and in previous research efforts. For example, job characteristics, motivation and productivity/performance are closely related as seen in the MPS model (Hackman and Oldham, 1976; Hackman, et. al., 1975). Goal setting, managerial style (participative, autocratic), goal and task information, and effort were found to be closely related variables in studies by Erez and Zidon (1984), Earley (1985), and Erez, Earley and Hulin (1985). In testing the model then, some collapsing or grouping of related factors was appropriate.

Another revision to the model as originally proposed was warranted because Conger and Kanungo, while discussing outcome expectancy and its relationship to self-efficacy and empowerment, did not specifically provide it a causal path in their model (1988:474-476). In proposing a revised model of the empowerment process for examination, therefore, it was decided to separate outcome expectancy from self-efficacy and empowerment to better assess the role of each construct.

The final reason for using the proposed experimental model rather than the more cumbersome one detailed by Conger and Kanungo was simplicity of design. Most of the experimental model could be tested with existing scales of known reliability, for example the MOAQ and AFIT Survey of Work Attitudes. Neither was it feasible given the limited time available to complete a longitudinal study, as would be necessary to faithfully capture the results of Stage V, the institutionalization of the empowerment process. With these constraints in mind, the simplified model is presented as Figure 2.

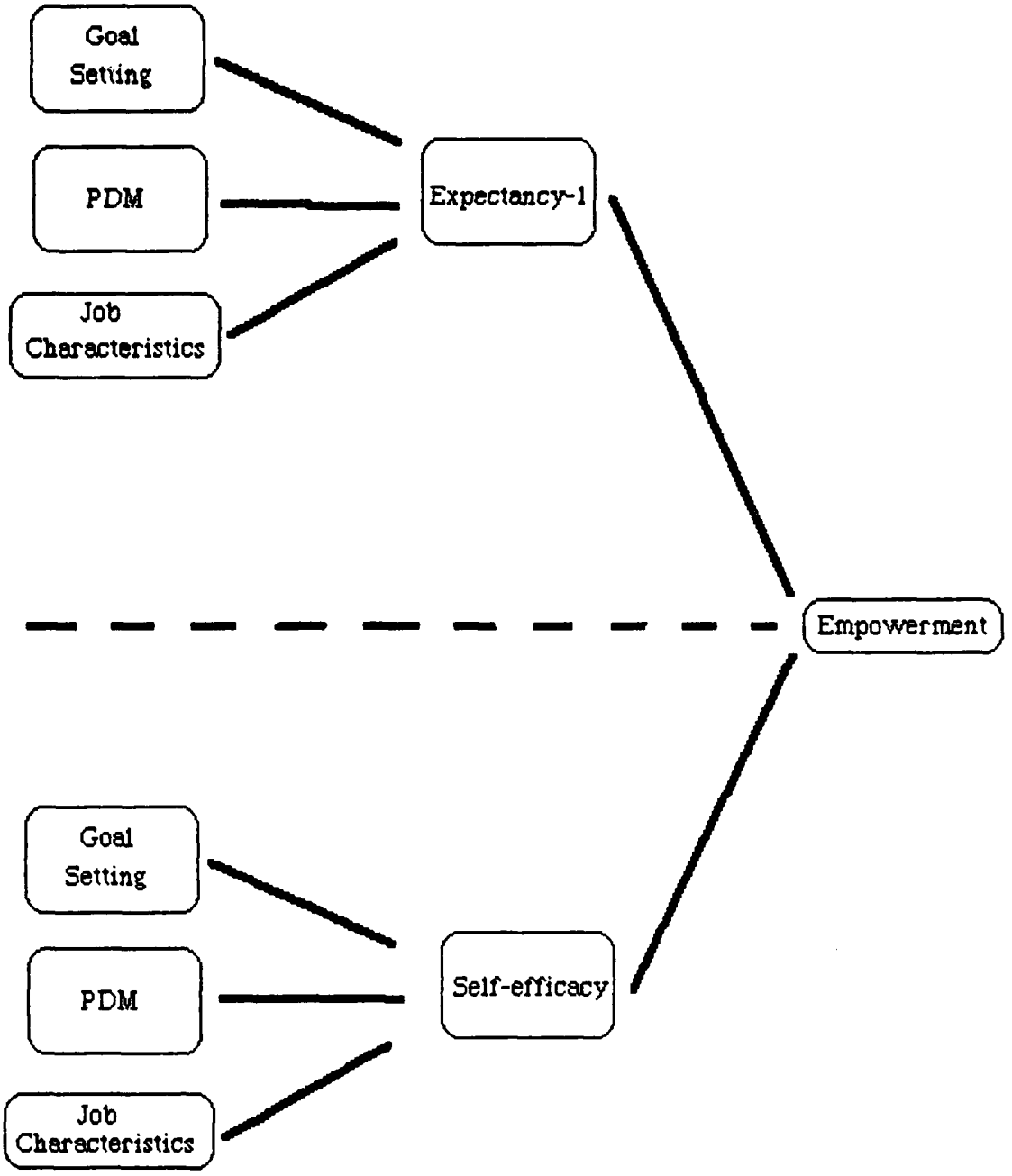

Figure 2. Hypothesized Empowerment Model

III. Methodology

Justification

If empowerment is a valid motivational construct, then the effects of empowering practices should be discernible as positive behavioral responses. Measuring increases in the quality of services or goods produced after empowerment techniques have been employed is one method of measuring desirable behavioral responses resulting from increases in levels of empowerment among employees. However, measuring increases in quality of services or products is merely an indicator of the success of such strategies and techniques, albeit an important one. Because empowerment is a behavioral construct, measuring *perceptions* and attitudes resulting from managerial empowering techniques is the most direct way to measure levels of empowerment. Identification of these perceptions and attitudes also indicates the degree of institutionalization of empowering techniques, and permits determination of which variables have the greatest effect on employee behavior in this regard. The survey method is ideally suited to such measurement.

Instrument

Variables of interest as candidates for change were assessed through a self-perception questionnaire. Scales used in the survey were drawn primarily from published sources with known and acceptable reliabilities,

e.g.: Air Force Institute of Technology Survey of Work Attitudes (1981, 1984, 1987--see Crow, 1987); and the Michigan Organizational Analysis Questionnaire (Cammann, et. al., 1983).

The previous review of the literature identified variables that would likely show the effects of the QP4 intervention. The first set of variables studied were primarily attitudinal, and included goal related, expectancy (based on expectancy-motivation theory), and satisfaction variables. The characteristics of a job, as perceived by respondents, as well as involvement variables were also measured. The second major set of variables dealt with psychological variables indicating degrees of self-efficacy and empowerment. These dependent variables were also selected based upon the previous literature review.

Having identified the variables of interest, the next step was to locate existing, published scales of sufficient reliability, and incorporate these scales into a survey instrument. Table 2 identifies the sources from which the scales used in this study were drawn, and indicates their relative grouping in the instrument. (Scales not annotated were used by a fellow researcher in his investigation at the same sites. It was decided to use a combined survey to lessen the disruption two separate, but similar, surveys would have caused the organizations involved.) The surveys used at both sites were essentially identical, the only changes made were to questions regarding work centers (different in each organization) and grade structure (one site having a much greater ratio of civilian to military employees than the other). The AGMC survey is attached at Appendix D for representational purposes.

Table 2. Sources for Survey Instrument Scales

Variables	Question #	Source
	Goal Setting	
Goal Clarity	10-13	Ivancevich & McMahon (1977)
Goal Difficulty	14-16	Ivancevich & McMahon (1977)
Knowledge of Results	17-18	Cammann, et. al. (1983)
Job Challenge	19-21	Cammann, et. al. (1983)
	PDM	
Participative Decision Making	22-26	AFIT (1983)
	Job Characteristics	
Freedom	27-28	Cammann, et. al. (1983)
Variety	29-30	Cammann, et. al. (1983)
Task Feedback	31-32	Cammann, et. al. (1983)
Task Completeness	33-34	Cammann, et. al. (1983)
Task Importance	35-36	Cammann, et. al. (1983)
Task Significance	37-38	Cammann, et. al. (1983)
Required Skills	39-40	Cammann, et. al. (1983)
Training Adequacy	41-43	Cammann, et. al. (1983)

Table 2. (Continued)

Variables	Question #	Source
	Expectancy-1	
Rewards	28-23 (II)	Cammann, et. al. (1983)
Support for Creativity	17-24 (II)	Siegel & Kaemmorer (1978)
Skills & Adequacy of Training	25-26 (II)	Cammann, et. al. (1983)
Effort/Outcome Probability	27	Jennings (1987)
Performance Obstacles/ Constraints	51-54 (II)	AFIT (1987)
	Self-efficacy	
Past Performance	8, 10, 15 (II)	Self-developed
Modeling	9 (II)	Self-developed
Emotional Arousal	11, 14, 16 (II)	Self-developed
Persuasion	13 (II)	Self-developed
	Empowerment	
Empowerment	61-69	Self-developed
	7, 12 (II)	Self-developed

NOTE: (II) denotes Part II of the survey instrument.

Population/Sample

Two military sites were surveyed. The first, AFLC LOC/MM, is primarily a staff-oriented organization comprised of eight hundred persons, most of whom fall under the convenient rubric "white collar." Nearly all (more than 90 per cent) individuals possess at least a college degree, and represent the mid to upper echelon of military (O4 to 06) and civil service (GS11-GM15) employees.

AGMC is one of the Air Force's industrial maintenance and repair centers. Employing some two thousand, six hundred persons (Utica Herald, 1988), AGMC is responsible for the repair of aircraft and missile inertial navigation units, maintaining precision measuring and standardization equipment used throughout the world by the Air Force, and a host of other technical measurement, laboratory and engineering consultant functions. The Center is primarily made up of highly skilled, technically-versed civil servants. The result is a highly stable, civilian work force subsumed within a military hierarchy, with military officers holding few, but critical oversight positions in the organization. The largest single concentration of employees is the maintenance section (MA) with over 1600 persons (AGMCVA 23-1, "Organization Manning and Directory Chart," 1988).

The original sampling design specified stratified groups, representative of work centers and grade structure, based on equal numbers of QP4 trained and non-QP4 trained respondents. Due to the length of the questionnaire, and to reduce the threat it posed, immediate supervisors administered the survey, asking the respondents to return the survey within the week. Specifics regarding the sampling plan and

administration were worked out with LOC/MM management and the AGMC QP4 cadre, to ensure representativeness.

The survey was administered at LOC/MM by supervisors over a two week period. At AGMC, the survey was initiated as part of the quality intervention, QP4, and was sponsored by the QP4 cadre. It was administered there by first line supervisors over a four week period. Efforts were taken at both sites to ensure that response was voluntary. In an attempt to preserve the anonymity of respondents, neither names or social security numbers were solicited.

Data Collection

Validity and Reliability. Validity may be defined as the extent to which an instrument measures what it claims to measure (Carmines and Zeller, 1979), while reliability is the level of consistency found in the instrument (Dominowski, 1980). Validity of the instrument was assured by developing the majority of the instrument from well regarded and extensively tested instruments. In an attempt to confirm the validity of the self-developed scales, the instruments were tested at two different sites, in the expectation that the self-developed scales would measure the same behavioral or attitudinal variable at each. Results follow in the section "Findings."

Computations in this study were performed using the Statistical Package for the Social Sciences (SPSSx) on the AFIT VAX-11/785 computer. The SPSSx RELIABILITY function provided "alphas," as described by

Table 3. Empowerment Survey Instrument Reliability

Variable Name	Survey Question Number	Reliability Alphas Publ	AGMC	LOC
Goal Setting		--	**.20**	**.10**
Goal Clarity	10 - 13	.90	.91	.94
Goal Difficulty	14 - 16	.85	.71	.65
Knowledge of Results	17 - 18	.31*	.54	.79
Job Challenge	19 - 21	.81*	.70	.67
PDM		**.87**	**.86**	**.90**
Job Characteristics		--	**.90**	**.79**
Freedom	27 - 28	.75	.89	.82
Variety	29 - 30	.81	.50	--
Task Feedback	31 - 32	.54	.93	.91
Task Completion	33 - 34	.58	.93	.93
Task Importance (impact)	35 - 36	.46	.90	.79
Task Significance	37 - 38	.45	.90	.85
Required Skills	39 - 40	.71	.30	.74
Training Adequacy	41 - 43	59	.75	.79

Table 3. (Continued)

Variable Name	Survey Question Number	Reliability Alphas Publ	AGMC	LOC
Expectancy-1		--	**.79**	**.68**
Rewards		--	.90	.60
(externally mediated/intrinsic)	28 - 29 (II)	.80	.57	.05
(internally mediated/intrinsic)	30 - 31 (II)	.75	.89	.90
(extrinsic)	32 - 33 (II)	.75	.75	.41
Support for Creativity	17 - 24 (II)	--	.85	.92
Skills and Adequacy of Training	25 - 26 (II)	.59	.10	.76
Effort/Outcome Probability	27 (II)	--	--	--
Performance Constraints	51 - 54 (II)	.61	.80	.59
Self-efficacy		--	**.69**	**.78**
Past Performance	8, 18, 15 (II)	--	.59	.76
Modeling (vicarious experience)	9 (II)	--	--	--
Emotional Arousal	11, 14, 16 (II)	--	.81	.87
Verbal Persuasion	13 (II)	--	--	--
Empowerment	61 - 69 7, 12(II)	--	**.93**	**.84**

n-sizes: LOC/MM: n=114 AGMC: n=327

Self-efficacy and empowerment scales self-developed

-- = data unavailable or alpha <0

Cronbach (1951). Table 3 relates the computed reliabilities of each scale, using coefficient alpha (internal consistency) as the measure of reliability. The reliability of all items was assessed at both intervention sites and compared with the reported reliabilities of the published scales, where this was possible.

The majority of the reliabilities were in the acceptable range, resultant alphas exceeding either the published reliability or .70. As a composite scale, however, goal setting was disappointing with an extremely low alpha of .10 to .20, even though each of the four lesser scales it encompassed were reliable over at least one site. For this reason, the proposed empowerment model was modified to reflect the structure in Figure 3, separating goal setting into its four components--goal clarity, goal difficulty, knowledge of results and job challenge. While most scales were fairly consistent across both sites and agreed well with published results (within .10), several scales varied significantly. Knowledge of results, task feedback, task completeness, task importance, and task significance all exceeded the respective published alphas by more than .20, but were still judged to be acceptable. Conversely, job challenge and variety, fell short of published alphas by .20, and were not considered reliable for use in this study. The author is at a loss to explain the reason for the difference in alphas recorded across sites for the scales variety and required skills. Of note, however, is the apparent reliability of the two self-developed scales critical to this study--self-efficay and empowerment. Questions making up scales that were determined to be unreliable (not used) appear in Appendix A.

Collection. Participants in this study were 118 LOC/MM and 327 AGMC employees, surveyed at their respective work places during normal work hours. The survey was conducted during the months of May, June and July, 1989. In both instances, the surveys were conducted as part of each organization's QP4 intervention.

Data Handling. Respondents were asked to complete the instrument on the two AFIT Form 11c's provided them. Space was also provided on the survey itself for comments and to indicate "grade" (military or civil service rank) outside the classes provided. Both the surveys and the machine readable forms were returned to the author. Data were entered into the AFIT VAX computer via opscan machine, and verified by the author using the original survey response forms. Data were grouped by organization, LOC/MM and AGMC, for analysis.

The Variables.

Goal Setting. A "composite" variable, proposed by the author, made up of goal clarity, goal difficulty, knowledge of results and job challenge. Intended to measure the clarity, specificity and difficulty of the work-related goals individuals set for themselves. Antecedent to expectancy and self-efficacy, precursors of empowerment.

Goal Clarity. Designed to measure the clarity of the goals that guide a respondent's work.

Goal Difficulty. Designed to measure the difficulty of the goals that guide a respondent's work.

Knowledge of Results. Indicates how much information the respondent is receiving as related to how well he is performing his job or the adequacy of his work. This normative information is used to set goals.

Job Challenge. Indicates the degree to which an individual has the opportunity to use new or special skills. Together with knowledge of job results, job challenge measures a respondent's psychological state as part of goal setting "arising from an individual's particular mix of of task and role characteristics" (Cammann, et. al., 1983:91).

PDM. Participative decision making. Designed to measure a respondent's perceived degree of influence over decisions made in the work place.

Job Characteristics. A multifaceted scale in the MOAQ derived from Hackman and Oldham"s Job Diagnostic Survey (1980), measuring aspects of the job an individual performs. This scale includes variety, task identity, task significance, autonomy and task-performance feedback. Job characteristics is used as a composite variable in testing the model, and is postulated to be another precursor of empowerment. The component variables follow.

Freedom. A measure of how much autonomy an individual has in completing a task.

Variety. A measure of the extent to which an individual's job is made up of different tasks, strengthening job commitment.

Task Feedback. A measure of how much information the respondent receives about the task he is performing.

Task Completeness. A measure of the extent to which a job allows the completion of an entire unit of product or service.

Task Importance. The extent to which an individual's task performance makes a significant difference in the final product or service. Together with task completeness, it is one of the two components of task identity.

Task Significance. The degree to which a respondent's task is likely to affect the lives or well-being of his co-workers.

Required Skills. A measure of the skill requirements of the job.

Training Adequacy. A measure of the degree to which the job requirements match the training and experience opportunities of the respondent.

Expectancy. A composite variable intended to measure a person's subjective probability of the likelihood that he can perform at a given level, or that effort on his part will lead to successful performance. Strongly influenced by each situation, and by previous experience in that and similar situations (Hackman and Lawler, 1971).

Rewards. A composite variable with three facets.

Externally Mediated Intrinsic Rewards. A measure of self-administered reward, contingent on some type of organizational action before an individual would reward himself.

Internally Mediated Intrinsic Rewards. A measure of self-administered reward that requires no action on behalf of the organization before an individual would reward himself.

Extrinsic Reward. Reward administered by the organization to an individual.

Support for Creativity. A measure of the degree to which the organization rewards an individual for attempting tasks in novel ways, or attempting new tasks.

Skills and Adequacy of Training. A measure of the degree to which the job requirements match the training and experience opportunities of the respondent, in the context that a good match permits an individual to perform at a specified level.

Effort-outcome Probability. Indicates the likelihood a respondent attaches to a particular outcome occurring as the result of his actions. The expected interaction is that more effort on behalf of the respondent results in the perception of a higher probability of a particular outcome occurring.

Performance Constraints. A measure of obstacles or barriers to performance, encompassing those induced by the job, communication, administration/policy and supervision.

Self-Efficacy. A self-developed composite scale intended to measure degrees of enabling behavior. The four sub-scales follow.

Past Performance. The degree to which successful past performance of tasks enables an individual to attempt new tasks.

Vicarious Experience. The degree to which observing other individuals accomplishing difficult tasks enables the respondent to complete difficult tasks.

Emotional Arousal. A measure of the degree of motivation an individual possesses to complete a task, based on supervisory inputs, such as challenge, competition, or other analogous strategies.

Verbal Persuasion. A measure of the degree to which a respondent is enabled to complete a task as a result of being convinced by another individual that the respondent can perform the task.

Empowerment. Self-developed scale measuring the reduction of respondents' perceptions of powerlessness over his work.

Training (The Intervention). AFLC LOC/MM, at the time of the survey, had instituted no formal QP4 training organization-wide. AGMC instituted its QP4 program beginning in April, 1988 (Foran, 1989). At the time the survey was completed, some 77 per cent of the total population at AGMC had received the 16 hour QP4 training course (Foran, 1989). QP4 was developed at AGMC in response to AFLC's quality initiative. As developed, QP4 is a short course in statistical process control, sampling methods, rudimentary statistical procedures, goal setting, team building, brainstorming and Theory Z management principles, intended for persons with little or no previous training in these areas. Each course runs one week (5 days, 6 classroom hours per day), entailing 16 hours of formal instruction, with the remainder of the time spent in discussion/working projects. The majority of employees take the course in the small, natural work groups of which they are members. From the initial training, more interested persons form process action teams or "PATs." PAT members are volunteers who identify problems and gather data directly related to their

jobs, in an effort to apply the QP4 methodology to resolve problems in the work place (ITT Research Institute, 1988).

Assumptions and Limitations. The greatest obstacle at the outset of this study was the length of the questionnaire, estimated to take an individual approximately one hour to complete. While this was daunting enough from an individual's perspective, and was expected to lead to some slackening of interest as an individual worked his way through the instrument, a larger concern surfaced in securing the privilege of conducting the survey at all, in light of the considerable amount of otherwise job related time completing it would require.

The original research design envisioned testing the model across all five Air Logistic Centers, as well as AGMC and the Cataloging and Standardization Center, (CASC, Battle Creek, MI). Due to time and fiscal constraints, as well as the unexpected difficulties encountered in developing the proposed scales for the self-efficacy and empowerment constructs, it was resolved to select only two sites for the research. To offset lack of generalizability to the larger AFLC population as a whole, sample sizes were increased. Target sample sizes of 175 for LOC/MM and 440 for AGMC were selected with response rates of fifty to sixty per cent expected, to maintain adequate statistical significance.

Statistical Tests

All tests were performed using SPSSx on the AFIT VAX computer. The first test performed, as discussed previously, was to determine the reliability of the instrument. The second test performed was a Pearson

correlation among all the independent variables (composite variables excepted) to determine which variables were highly correlated with one another. The third test used stepwise multiple regression of all the independent variables (composite variables excepted) versus the dependent variable empowerment to determine if a suitable model could be formulated across the research sites, and identifying empowerment precursors. The fourth step was to complete two stepwise multiple regressions with the data, first with expectancy and then with self-efficacy as the variables of interest, with empowerment as the dependent variable, using all independent variables as the universe. This model was postulated to illustrate the significance of expectancy and self-efficacy as predictors of the empowerment construct. The fifth step involved another multiple regression, this time with all independent variables except empowerment, expectancy, self-efficacy and the composite variables, against the first dependent variable, expectancy, and then the second dependent variable self-efficacy. This regression was formulated to determine which variables predict expectancy (hypothesis H5) and self-efficacy (hypothesis H6) best. All regressions were completed with the two different data sets, LOC/MM and AGMC, so as to construct two causal models, and ascertain the generalizability of the resultant model across sites, in an attempt to assure its validity.

Having determined a causal path for the empowerment model, the next step was to determine the effectiveness of the intervention, QP-4, addressed by hypotheses (H1-H4). As only AGMC had a formal intervention of known proportions in place, only AGMC data was used for this analysis.

A series of t-tests was performed to determine the significance of variables of interest. The first test simply pitted QP4 training (collapsed to a dummy variable) against all independent variables (including composites), in the expectation that the intervention would indicate significantly higher levels of empowerment and its antecedents and precursors among trained individuals versus those who had received no training. The next step paired all demographic (dependent variables) against all independent variables in a Fischer's least significant difference (LSD) procedure, to make all possible pairwise comparisons in a search for further effects of the intervention and paths of the model. Once a significant difference was determined to exist, the sample was segregated into two groups and a t-test performed to determine the significance of the interaction among the demographic variable and empowerment. For example, the Fischer's LSD procedure indicated that there were significantly different means across the independent variables for the two age groups 30 and under, and over 30. At this point a simple examination was made to determine which group varied across any single independent variable, e.g., PDM, in the same direction as the independent variable of interest, empowerment. Separate variance t-tests were used whenever t-tests were employed to offset the effects of significantly different n-sizes in the groups formed by the dummy variables.

For regression models, "betas" were deemed significant if they exceeded .25--explaining more than twenty-five per cent of the variance encountered. For t-tests, significance was set at "p" less than, or equal to, the .10 level.

IV. Findings and Analysis

Demographics

Participants in this study were 114 LOC/MM and 327 AGMC employees. Originally, it was intended to stratify the samples to ensure that 50 per cent of the respondents had not received QP-4 training, while still maintaining a sample representative of the two organizations' grade structures and work centers. Approximately half the LOC/MM respondents stated they had received no QP4 type of training in their work place. Those that had received training regarding quality, statistical controls and team building, garnered it outside of their primary work place. While the desired stratification based on intervention was achieved in the LOC/MM group, due to the longevity of the QP4 program at AGMC, only 25 per cent of these respondents had received no training. The response rate was approximately 60 per cent at each site. LOC/MM personnel were "career mobile," 50 per cent having worked for LOC/MM for 5 years or less, and 75 per cent having worked for either LOC or MM for 10 years or less. In this regard, AGMC personnel tended to be more stable, with longer terms of employment within one organization. The majority of AGMC respondents possessed high school degrees and formal vocational/technical training, only 18 per cent having bachelor's degrees or higher. The majority (more than 90 per cent) of LOC/MM personnel responding held bachelor's degrees or higher. Summary demographic statistics are presented in Tables 4 and 5.

Table4. LOC/MM Demographic Data

Age	Frequency	Percent
More than 60 years	2	1.8
51 to 60	22	19.3
41 to 50	63	55.3
31 to 40	27	23.7
Total	114	100.0

Education Level	Frequency	Percent
Masters Degree	53	46.5
Some Graduate	19	16.7
BS/BA Degree	32	28.1
Assoc. Degree	1	.9
Some College	8	7.0
Non High School	1	.9
Total	114	100.0

Grade	Frequency	Percent
Other	89	78.1
O3 to O4	13	11.4
O1 to O2	2	1.8
GS10 to GS12	1	.9
GS1 to GS3	9	7.9
Total	114	100.0

Table 4. (Continued)

Training	Frequency	Percent
More than 16 hours	27	23.7
16 Hours	36	31.6
None	51	44.7
Total	114	100.0

Sex	Frequency	Percent
Other responses	1	.9
Female	7	6.1
Male	106	93.0
Total	114	100.0

PAT Member	Frequency	Percent
Other responses	2	1.8
12 to 24 months	3	2.6
6 to 12 months	4	3.5
5 to 6 months	5	4.4
3 to 4 months	10	8.8
1 to 2 months	90	78.9
Total	114	100.0

Table 4. (Continued)

Work Center	Frequency	Percent
Other	17	14.9
MM	49	43.0
LOC	48	42.1
Total	114	100.0

Time in Service	Frequency	Percent
More than 30 years	1	.9
25 to 30 years	0	0
20 to 25 years	3	2.6
10 to 15 years	8	7.0
5 to 10 years	29	25.4
1 to 5 years	58	50.9
Less than a year	15	13.2
Total	114	100.0

Table 5. AGMC Demographic Data

Age	Frequency	Percent
More than 60 years	11	3.4
51 to 60	52	15.9
41 to 50	93	28.4
31 to 40	92	28.1
26 to 30	44	13.5
20 to 25	24	7.3
Less than 20	11	3.4
Total	327	100.0

Education Level	Frequency	Percent
Doctoral Degree	1	.3
Masters Degree	8	2.4
Some graduate	14	4.3
BS/BA Degree	43	13.1
Assoc. Degree	48	14.7
Some College	78	23.9
Tech or Trade School	66	20.2
High school or GED	59	18.0
Non high school	10	3.1
Total	327	100.0

Table 5. (Continued)

Grade	Frequency	Percent
Other	125	38.2
O3 to O4	26	8.0
O1 to O2	8	2.4
GS10 to GS12	75	22.9
GS7 to GS9	66	20.2
GS4 to GS6	11	3.4
GS1 to GS3	16	4.9
Total	327	100.0

Training	Frequency	Percent
Other responses	36	11.0
More than 16 hours	118	36.1
16 hours	101	30.9
None	72	22.0

Sex	Frequency	Percent
Other responses	34	13.8
Female	61	32.4
Male	221	67.6
Total	327	100.0

Table 5. (Continued)

PAT Team Member	Frequency	Percent
Other responses	26	8.0
More than 24 months	24	7.3
12 to 24 months	15	4.6
6 to 12 months	17	5.2
5 to 6 months	18	5.5
3 to 4 months	30	9.2
1 to 2 months	197	60.2
Total	327	100.0

Work Center	Frequency	Percent
Other responses	16	4.9
2803 ABG	15	4.6
ML	53	16.2
XP	10	3.1
SC	4	1.2
MA	224	68.5
DS	5	1.5
Total	327	100.0

Time in Service	Frequency	Percent
More than 30 years	3	.9
25 to 30 years	21	6.4
20 to 25 years	42	12.8
15 to 20 years	20	6.1
10 to 15 years	38	11.6
5 to 10 years	51	15.6
1 to 5 years	92	28.1
Less than a year	60	18.3
Total	327	100.0

Results and Analysis

Results of the Pearson correlations are attached at Appendix B. The results of the stepwise multiple regression to determine a model, viable across sites, of the empowerment phenomenon follows. Criteria for selection in the empowerment model included independent variables common to both models' regression equations, and an adjusted R-squared (coefficient of determination) exceeding .30 for each.

Empowerment. The resultant models consistently identified emotional arousal, goal clarity, skills and adequacy of training and support of creativity as variables acting as precursors to the empowerment construct, identifying a simple, yet powerful model. The presence of the common variables at each site, as well as coefficients of determination for each site well above the .30 threshold, clearly indicates empowerment is a bona fide psychological and behavioral construct. Although none of the composite variables were included in the final model, the lesser variables selected represent the composite variables goal setting, expectancy and self-efficacy, ignoring only those variables listed under job characteristics and PDM. This indicates the importance of goal setting, expectancy, and self-efficacy for predicting and detecting empowering behavior. Also notable was the fact that skills and adequacy of training (a measure of the degree to which the job requirements match the training and experience opportunities of the respondent) was inversely related to empowerment. Finally, the relative importance (as expressed by a higher or lower "beta") of each variable was

Table 6. Tests for Empowerment Model

LOC/MM

Adjusted R^2 = .70 N = 114

Variable	Beta	F	Significance of F
Emotional arousal	.36	26.63	.00
Goal clarity	.26	19.80	.00
Skills/ tng. adequacy	-.27	24.54	.00
Support for creativity	.25	14.00	.00

AGMC

Adjusted R^2 = .43 N = 327

Variable	Beta	F	Significance of F
Emotional arousal	.16	10.90	.00
Goal clarity	.13	6.80	.01
Skills/ tng. adequacy	-.24	26.48	.00
Support for creativity	.41	88.55	.00

not fixed in ranking between the two sites. (Note that although the variables support for creativity and skills and training adequacy both came from the same composite variable expectancy, they represent diverse components of the same concept.)

Expectancy and Self-efficacy. The next series of multiple regressions was to determine the importance of expectancy and self efficacy to the empowerment construct. The results follow in tabular form, with the associated betas attached in the causal path model, Figures 3 and 4. Betas were highly significant across both sites, with the resultant coefficients of determination indicating an acceptable degree of correlation between expectancy and empowerment, and self-efficacy and empowerment. Expectancy and self-efficacy, therefore, were found to be consistent predictors of the level of empowerment in each organization.

Empowerment Precursors. The final regression was to determine which of the independent variables (not including composite variables) best predict the constructs expectancy and self-efficacy, and are thus precursors of empowerment.

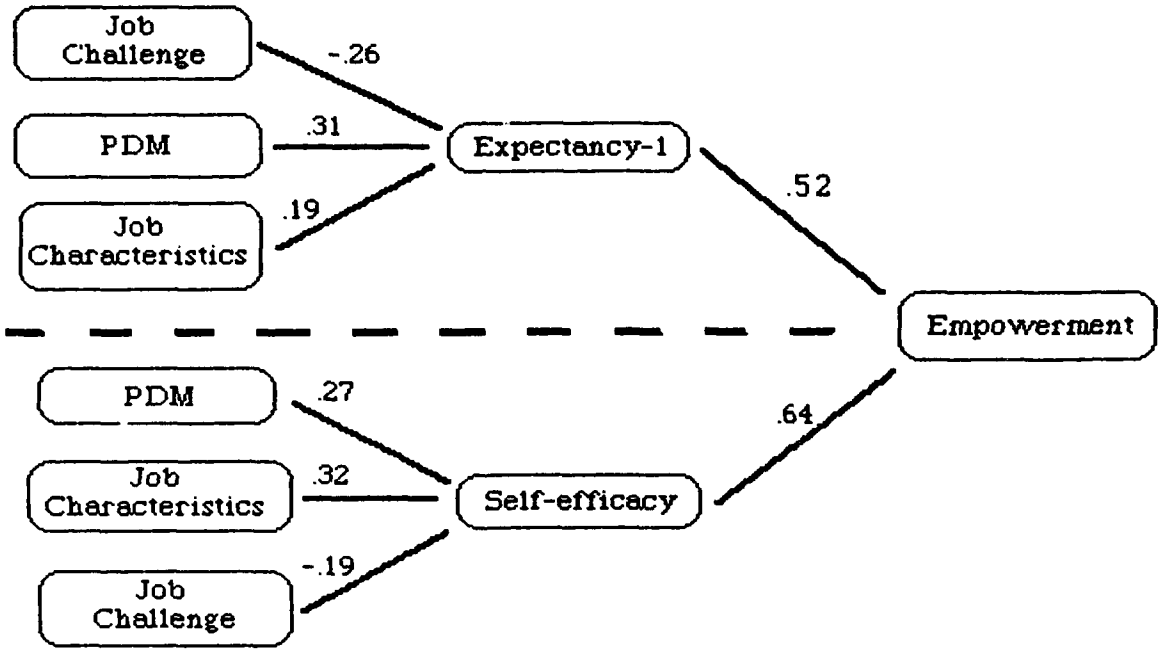

Figure 3. Empowerment Model "Betas" (LOC/MM)

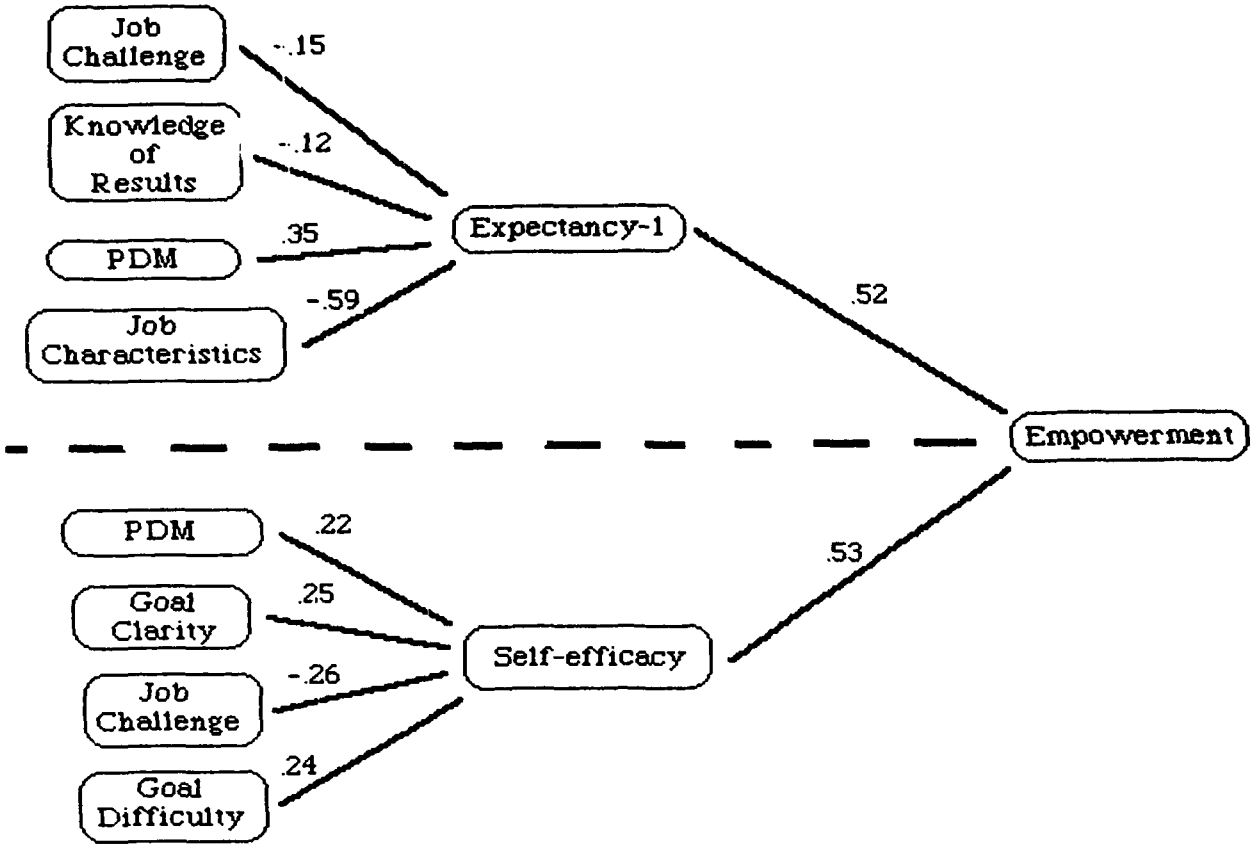

Figure 4. Empowerment Model "Betas" (AGMC)

Table 7. Empowerment Model

Relationship of Expectancy and Self-efficacy

LOC/MM

Adjusted R^2 = .27 N = 114

Variable	Beta	F	Significance of F
Expectancy	.52	43.38	.00

Adjusted R^2 = .40 N = 114

Variable	Beta	F	Significance of F
Self-efficacy	.64	76.47	.00

AGMC

Adjusted R^2 = .27 N = 327

Variable	Beta	F	Significance of F
Expectancy	.52	122.59	.00

Adjusted R^2 = .27 N = 327

Variable	Beta	F	Significance of F
Self-efficacy	.53	123.74	.00

Table 8. Empowerment Model

Precursors of Expectancy and Self-efficacy

LOC/MM

Dependent variable: Expectancy

Adjusted R^2 = .32 N = 114

Variable	Beta	F	Significance of F
PDM	.31	11.37	.00
Job Challenge	-.26	9.64	.00
Job Characteristics	.19	4.53	.04

Dependent variable: Self-efficacy

Adjusted R^2 = .35 N = 114

Variable	Beta	F	Significance of F
PDM	.27	9.07	.00
Job Characteristics	.32	13.38	.00
Job Challenge	-.19	5.38	.02

AGMC

Dependent variable : Expectancy

Adjusted R^2 = .25 N = 327

Variable	Beta	F	Significance of F
Job Challenge	-.15	7.41	.01
Know. of Results	-.12	4.62	.03
PDM	.35	32.62	.00
Job Characteristics	-.59	87.97	.00

Table 8. (Continued)

Dependent variable: Self-efficacy

Adjusted R^2 = .19 N = 327

Variable	Beta	F	Significance of F
PDM	.22	12.85	.00
Goal Clarity	.25	18.02	.00
Job Challenge	-.26	15.87	.00
Goal Difficulty	.24	12.03	.01

Again, the betas have been placed on the appropriate path of the causal model, Figures 3 and 4. Note first that two variables, PDM (participative decision making) and job challenge are found across both sites as predictors of both self-efficacy and expectancy behaviors. PDM was the most consistent predictor across both sites and both dependent variables, with betas ranging from .22 to a high of .35. Job challenge, while not as strong a predictor, was consistently inversely related to expectancy and self-efficacy, however--indicating that respondents with excess skill and ability to complete their jobs, or with jobs that do not overtax them, had greater expectancy and self-efficacy values. Put another way, individuals with high outcome expectancy and self-efficacy values, have a "reservoir" of ability and skill to throw into their jobs, and do not find their jobs overly taxing to complete. The composite variable job characteristics appeared in three of the four possible paths. Although job characteristics was the single strongest predictor of expectancy in the AGMC model, it was inversely related--quite different from the positive, and weaker predictive ability indicated in the LOC/MM model. The negative score at AGMC may be due primarily to the vastly different nature of the organizations--LOC/MM is a more staff-oriented organization composed of mid-management personnel performing a diversity of functions and working many projects, versus the predominantly technical, production-oriented and routine tasks performed by most of the labor force at AGMC. The only other factors entering the model at AGMC (all variables in the LOC/MM model having been accounted for) were knowledge of results as a predictor of expectancy, and goal clarity and goal difficulty as predictors of self-efficacy. That these variables would emerge

was anticipated based upon the literature review--that they did not surface in the LOC/MM group is of note.

Effects of the Intervention. The next step was to determine the effects of the intervention, QP4 training. Only two variables indicated a significant change as a result of the intervention; the results are shown below. (Note: t-test sample group sizes vary and do not add up to the total sample n size of 327 due to spurious answers, or answers that were outside the scale's valid range.)

That the intervention significantly impacted only two independent variables of the some twenty-five studied indicated that training has not had the expected impact of increasing levels of empowerment among respondents. Further, it was anticipated that the group having completed QP4 training would express greater reliance on both variables, not just past performance. That the trained group did not move in the same direction for both task importance and past performance, and that both variables did not move in the same direction as empowerment, indicates that training, at least as measured in this manner, has had no discernible impact on respondents' levels of empowerment.

Table 9. Effect of QP4 Training (Intervention)

TASK IMPORTANCE				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
No training	72	11.17	2.87	1.71	130.92	.09
16 hours,+	219	10.48	3.13			

PAST PERFORMANCE				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
No training	72	8.15	2.58	-1.84	121.53	.07
16 hours,+	219	8.80	2.59			

Empowerment and QP4 Training, Revisited. Due to the apparently poor results of the intervention on raising levels of empowerment among respondents, ONEWAY analysis of variance (ANOVA) was conducted to determine how best to collapse the groups within a dependent variable to achieve dichotomous variables (a variable with a significant difference in the means between the two groups it encompasses) suitable for verifying the presence of variables acting as precursors of empowerment. The following variables were formed: Training/no training; male/female; PAT member/non-member; civil service grade to GS9/GS10 or higher; some college/associate degree or higher; age less than 30 years/more than 30 years; not a supervisor/supervise one or more persons; work center MA/ all other work centers; and less than five years in service/more than five years in service. A separate variance t-test was conducted with the dichotomous dependent variables against all independent variables (composite variables other than empowerment excepted). Dependent variables that exceeded $p<.10$ for the variable empowerment were further analyzed to determine if there were any independent variables that consistently predicted empowerment. For instance, if employees of the MA work center were more empowered than those of the other work centers combined (exhibiting a higher mean), this group of respondents should also exhibit higher mean scores across the majority of independent variables ($p<.10$). Four of nine dependent dichotomous variables were found to show the effects of empowerment--number of people supervised, grade, time in service and work center. The results of the t-tests are summarized in Table 10. Individual t-test results may be found in Tables 11-14 at Appendix C.

Table 10. Summary of Direction of Change of Common Independent Variables versus Empowerment

Variable	Non-super	GS9 or less	5yr or less	Non-MA
Empowerment	+	+	+	+
PDM	+	+	+	+
Freedom	+	0	+	+
Task variety	+	0	+	+
Task feedback	+	0	+	+
Task completeness	+	0	+	+
Task importance	+	0	+	+
Task significance	+	0	+	+
Skills & adeq. of training	+	+	0	+
Emotional arousal	+	-	+	+

+ = positive direction (all $p<.10$)

- = negative direction

0 = no signif. change

Supervision. Non-supervisory personnel were more empowered than persons supervising three or more people. Of the fifteen independent variables significantly different between supervisory and non-supervisory personnel, ten moved in the same direction as empowerment. More specifically, the more empowered group (non-supervisors) had higher mean values for the variables goal clarity, PDM, freedom, task variety, task feedback, task importance, task completeness, task significance, training adequacy and emotional arousal, than did supervisors.

Grade. Individuals holding positions of GS9 or lower reported greater levels of empowerment than individuals of higher civil service grade. Of the seven independent variables significantly different between the two groups, five (PDM, adequacy of training. reward. support for creativity and past performance) varied in the same direction as empowerment.

Time in Service. Persons who had been employed at AGMC for five years or less reported themselves to be more empowered than those individuals with greater employment longevity. Eleven variables were found to be significant, and in nine of these--PDM, freedom, task variety, task feedback, task completeness, task importance, task significance, performance constraints and emotional arousal--higher mean scores accompanied the more empowered group.

Work Center. The final grouping over which empowerment was a significantly different variable was work center. Individuals working in MA reported themselves less empowered than all other individuals grouped together as a single entity. Of the twelve significant variables, ten-

-goal clarity, knowledge of results, PDM, freedom, task variety, task feedback, task completeness, task significance, adequacy of training and emotional arousal--were all reported as lower mean scores in the less empowered group (MA).

Summary. First, locating variables that moved in the same direction as empowerment confirmed again the presence of an empowerment concept and validated hypotheses (H1) through (H4). Second, two variables, PDM and emotional arousal, were found across all four dichotomous dependent variables (supervision, grade, time in service and work center), and in all but one instance moved in the same direction as empowerment. Emotional arousal surfaced as a significant independent variable in the initial regression model verifying the presence of the empowerment construct. Nine independent variables--freedom, PDM, task variety, task feedback, task importance, task significance, task completeness, task importance, skills and adequacy of training, and emotional arousal--were found across the dependent variables supervision, time in service and work center. These independent variables also varied in the same direction as empowerment, indicating the strength of these variables both as predictors of empowerment and as viable targets for managerial strategies geared to increase levels of empowerment.

However, as divided, the variables supervision, grade and time in service likely identified the dimensions of a common group. The preponderance of new individuals at AGMC, as in any organization, would tend to hold entry level, non-supervisory positions. These are the very people expressing both the highest levels of empowerment and its

predictors. The significance of this finding for management is that these are the employees closest to the root processes in the organization--the persons actually producing goods or services. These are also the employees closest to the source of any variation in the production process, hence they are the persons best situated to control variance. Empowerment, task enrichment strategies, participative management and emotional arousal are all strategies that have impacted this group, and can therefore be used to increase innovation among them and improve the quality of their products and services.

This phenomenon begs the question of causation--did the QP4 training increase the levels of empowerment among these individuals? To consistently impact so many variables across the group, some mechanism appears to be afoot. The previous, forthright analysis of training against the construct empowerment and its predictors found little effect. As the organization begins to evolve as the result of the intervention, however, the initial effects of the training should be expected to appear not on the empowerment construct itself, but rather on as a corporate atmosphere supportive of training and change. The individuals most empowered were least senior in terms of civil service grade, time in service and held non-supervisory positions. Because these persons have less at stake in the organization's welfare than those individuals more senior to them (and closer to reaping retirement benefits, less willing/able to relocate or learn new skills), identify with AGMC less by virtue of having worked there for a shorter period of time and were generally less entrenched in the mind set of

"we've always done it that way," these persons are the first we would expect training to impact.

The MA work center respondents reported themselves as less empowered than all other work centers combined (representing a diversity of tasks and managerial levels). Because MA is most analogous to a purely production environment, tasks here tend to be repetitious and routine. MA is an area where empowerment strategies hold greatest potential--but also great risk, because it is at the heart of AGMC's repair and refurbish mission. Innovation, job enrichment and risk taking here will be the most difficult because of the tremendous adverse impact on the mission of a failed large scale intervention coupled with the current security employees enjoy in the status quo, and expressed as a resistance to change.

In summary, QP4 has begun to foster an atmosphere supportive of change and innovation--one conducive to empowerment. A future assessment of the organization will be required to more directly correlate the effects of QP4 training and empowerment, as well as more specifically identify new areas of emphasis for inclusion into the training program. Specific areas of emphasis determined as a result of this study follow in the next section.

V. Conclusions and Recommendations

Conclusions

The the statistical tests outlined in the preceding chapter confirm that empowerment is a valid motivational and psychological construct, with identifiable precursors and predictors. Levels of empowerment, at least to a small degree, are subject to the influences of training. Participative decision making and emotional arousal are two prime managerial interventions for increasing levels of empowerment.

Recommendations--Practical Application

Continued Education and Training. As an intervention, the tools provided employees by QP4 training are merely the first step toward empowering them. To prevent QP4 from becoming just another managerial "flavor of the month," the next step is to permit and encourage employees to continually put these tools to use. Four strategies hold promise here.

First, the increases in training and education begun with the initial QP4 training must continue. The institutionalization of empowerment will be reflected as a shift in the organization's "corporate culture" toward an overall higher quality of work life (QWL) throughout. The significance of participative decision making, emotional arousal and task enrichment to this increase in QWL is clearly seen in the previous chapter. It will take continued emphasis on these techniques, as well as a willingness on behalf of management to make them a part of everyday activities at all levels of

the organization, to keep them from being more than just a transistory shift in managerial emphasis. Continued training and education, as well as continual evolution in what is taught (so as to meet the changing needs of the work force) is essential to the institutionalization process.

Organizational Structure. Second, the organization's internal structure must be reviewed and revised to encourage risk taking. Structural segmentalism (see Kanter, 1983:343-7), or compartmentalized approaches to organizational change, must be vitiated. With the tools of team building, statistical process control and other facets of QP4, the employees closest to sources of unwanted variation are in a position to not only identify the causes of this variation, but to suggest and implement remedies to control it. Employees must be given support among all levels of the organization to gather the resources--fiscal, physical and personnel--to change practices that they identify as deleterious to the quality of product or service the organization provides. Management must ensure that an atmosphere fostering such innovation is present, and assist employees to incorporate such innovation in the organization's business plan. Such an atmosphere reinforces the message of QWL provided by PDM, emotional arousal and task enrichment, as discussed previously. Do not, however, misinterpret this as a clarion call for standing the organization on its head in terms of how it functions or is organized. The key here is continual, incremental change, made at the level where variation can be controlled, fostered by a supportive managerial atmosphere. Just as QWL spins itself into an ever greater share of the organization's cultural fabric, just as empowerment continues to be institutionalized, so will the organizational

structure evolve to meet these changes, to continue pushing responsibility down to the lowest levels. This not only ensures control of the process at the point of variation, but makes individuals stakeholders in the success of the organization as a whole, as well as permitting them to identify with an entire product or service.

Performance Measures and Incentives. Third, the organization must make a two-pronged effort to assess its performance. The organization must examine its internal and external performance measures, and provide incentives that reward and further encourage successful performance and innovation. In assessing internal performance measures the organization must ensure that it does not fall prey to using specific performance measures solely because they are there. A reappraisal of the processes an organization is involved with must be made to determine what outputs and services are really most important to customers the organization serves. Having done this, the next step is to identify and rank-order the aspects of quality most valued by the customer in these products and services--timeliness, precision in order filling, product protection during shipping, innovative product features, etc.--and make the necessary changes in the organization to meet these demands. Measuring the performance of the organization against other, similarly situated organizations, "benchmarking" (Ernst and Whinney, 1987:155-9) performance against dissimilar organizations, and performing customer service audits (Stock and Lambert, 1987:131-144) are all vehicles to expose employees to ways other organizations do business, to indicate management's support for innovation,

and to encourage and enable employees to take greater control of an organization's processes.

Management's Role. Finally, the role of supervisors, particularly middle managers, must change. Managers must become facilitators of innovation and change, seeking to get the most autonomy, responsibility and innovation from each of his associates, rather than merely the most hourly production.

Specific strategies highlighted by the research include implementation of more participative managerial styles, particularly in setting goals and in providing employees efficacy information. Emotional arousal and feedback are also easy targets for increasing innovation and autonomy. The overarching goal of all such strategies should be for first line supervisors to assist employees in locating sources of variance they can control, building their self confidence so that they can do so, and assisting these individuals or PAT teams with the gathering of resources necessary to effect the changes sought. Persons identifying particular areas as problems should see that management supports their efforts to resolve these problems, but management should not provide any specific manner in which to accomplish problem resolution, other than ensuring that the individuals understand the legal, procedural and environmental sphere in which such change is confined. PATs and interested individuals function, then, in an environment of change that is performance based. The goal is simply to continually examine and incrementally improve the organization's processes--how these changes are effected is up to the stakeholders--the employees of the firm.

Such an environment may require an organizational restructuring, from the typical bureaucratic model to a more flattened managerial hierarchy as the role of supervisors changes from that of final quality inspector to that of coach, advisor and facilitator. The threat, particularly to middle management, is not to be underestimated. However, it is only when all parties redefine their roles in the organization and take an active stake in the welfare of it, that quality can become a normal, everyday occurrence, not something "inspected in."

Strategic Planning. Of course, all these strategies require time--the continued support of upper levels of management over the long term. Continued support of the organizational and managerial changes required to institutionalize empowerment, to alter the organization's corporate culture to "building in" rather than "inspecting in" quality, must be strategic goals of the organization, and should be expressed as such to employees at the inception of such change. As in any intervention, change and counter-change will occur, the excitement generated by PDM, new training programs, and organizational restructuring will wane. Regardless, employees must understand that despite changes in leadership, seeming lack of progress, or managerial blind alleys, the organization is unwaveringly committed to increasing the quality of products and services produced, and that the way to do this is to empower employees to take control of the processes as stakeholders in the firm.

Recommendations for Further Study

The lack of a longitudinal study presents some serious problems in this research. It is expected that being able to gather data prior to and after a QP4 intervention would detect much greater degrees of empowerment, as well as identify more managerial strategies for increasing empowerment levels. Contamination is a serious threat in examining this construct, particularly as an individual does not have to be a direct recipient of training to benefit from it. A supervisor that fosters team building, practices PDM, knows about statistical process controls and is a risk taker can empower untrained subordinates. Too, one would expect a gradual shift in the corporate culture of an organization after successful implementation of an intervention like QP4--institutionalization of the empowerment process. The differences between empowerment levels at different echelons--blue collar versus management or staff--deserves continued examination to determine if particular empowerment strategies are better suited to a particular environment. Further refinement should be made of both the empowerment model and the survey instrument to increase their generalizability to human behavior on the whole. Certainly their validity would be greatly enhanced by obtaining similar results from sites other than those visited in this study.

Appendix A. Survey Questions Not Included in Results

15. Results expected in my job are very difficult to achieve.

20. On my job, I seldom get a chance to use my special skills and abilities.

26. My supervisor usually asks for my opinions and thoughts in decisions regarding my work.

69. Based on previous performance and current knowledge of my present job, I can achieve more difficult goals is I so desire.

7 (II). I am empowered to do everything i need to do on my job.

16 (II). My managers and supervisors empower me to do all the tasks I need to do.

18 (II). Around here people are allowed to try to solve the same problem in different ways.

20 (II). People in this organization are always searching for fresh, new ways of looking at problems.

21 (II). The leadership acts as if we are not very creative.

51 (II). Job Induced Constraints (factors in the actual make-up of the job itself such as machine breakdown, inadequate tools and supplies, etc.)

Appendix B. LOC/MM Pearson Correlation Coefficients

	Clarity	Difficulty	Results	Challenge	PDM	Freedom	Variety	Feedback
Goal **Clarity**	1.00							
Goal **Difficulty**	-.49	1.00						
Knowledge of **Results**	-.59	.25	1.00					
Job **Challenge**	-.42	.67	.32	1.00				
PDM	.39	-.24	-.40	-.35	1.00			
Task **Freedom**	.47	.19	-.42	-.21	.48	1.00		
Task **Variety**	.25	.08	-.21	-.13	.20	.25	1.00	
Task **Feedback**	.61	-.34	.53	-.28	.40	.53	.31	1.00
Task **Completeness**	.37	-.28	-.25	-.29	.25	.38	.24	.45
Task **Importance**	.50	-.36	-.37	-.34	.30	.43	.13	.55
Task **Significance**	.25	-.28	-.29	-.38	.30	.33	.01	.32
Required **Skills**	-.27	.47	.22	.44	-.16	.13	.10	-.15
Training **Adequacy**	.22	.11	-.01	.09	.09	.33	.06	.21

LOC/MM Pearson Correlation Coefficients (Continued).

	Clarity	Difficulty	Results	Challenge	PDM	Freedom	Variety	Feedback
Rewards	.38	-.29	-.31	-.35	.33	.38	.07	.32
Support for **Creativity**	.43	-.38	-.42	-.41	.52	.53	.15	.51
Skills&Adeq **of Training**	-.20	.04	.11	-.16	-.12	-.36	.08	-.17
Effort/Out **Probability**	.21	-.08	-.18	-.13	.21	.21	.16	.22
Performance **Constraints**	-.31	.26	.22	.21	-.11	-.13	-.02	-.28
Past **Performance**	.33	-.19	-.20	-.27	.32	.22	.06	.33
Modeling	.18	-.17	-.10	-.26	.19	03	01	.13
Emotional **Arousal**	.46	-.19	-.38	-.31	.52	.65	16	.53
Verbal **Persuasion**	.34	-.16	-.31	-.28	.26	.17	.10	.34
mpower.	.59	-.23	-.49	-.26	.57	.65	.21	.57

LOC/MM Pearson Correlation Coefficients (Continued).

	Complet	Import.	Signific.	Skills	Adequac.	Rewards	Creativ.	Training
Task **Completeness**	1.00							
Task **Importance**	56	1.00						
Task **Significance**	.10	.51	1.00					
Required **Skills**	- 05	- 24	-.34	1.00				
Training **Adequacy**	.16	.06	.02	.12	1.00			
Rewards	.19	.36	41	-.11	.04	1.00		
Support for **Creativity**	.26	.41	.38	-.24	11	.53	1.00	
Skills&Adeq. **of Training**	-.12	- 07	.05	-.10	-.75	-.16	-.23	1.00
Effort/Out. **Probability**	.18	11	.22	.01	.05	.22	.23	-.03
Performance **Constraints**	- 08	- 17	-.08	.09	- 01	-.19	-.27	.01
Past **Performance**	25	.38	.19	-.11	.02	.34	.26	- 02
Modeling	.04	12	.06	-.14	.06	.17	.14	- 04
Emotional **Arousal**	25	41	.40	-.12	24	.47	.64	- 29

I OC/MM Pearson Correlation Coefficients (Continued).

	Complet	Import	Signific	Skills	Adequac.	Rewards	Creativ.	Training
Verbal **Persuasion**	21	24	05	- 01	-.02	.22	.31	- 05
Empower.	35	44	32	- 11	.41	.48	.66	-.48

	Probabil	Constrain	Perform	Modeling	Arousal	Persuas.	Empower
Effort/Out **Probability**	1 00						
Performance **Constraints**	- 11	1 00					
Past **Performance**	38	03	1 00				
Modeling	18	- 08	40	1 00			
Emotional **Arousal**	24	- 12	46	17	1 00		
Verbal **Persuasion**	22	- 17	46	36	23	1 00	
Empower.	25	- 18	39	22	22	33	1 00

AGMC Pearson Correlation Coefficients

	Clarity	Difficulty	Results	Challenge	PDM	Freedom	Variety	Feedback
Goal **Clarity**	1.00							
Goal **Difficulty**	- 39	1.00						
Knowledge of **Results**	- 60	.19	1.00					
Job **Challenge**	- 24	52	17	1.00				
PDM	3	- .30	- 27	- 42	1.00			
Task **Freedom**	-	- 33	- 42	- 40	.50	1.00		
Task **Variety**	42	- .36	- 35	- 39	.44	.75	1.00	
Task **Feedback**	52	- 38	.54	- 42	.46	.75	.77	1.00
Task **Completeness**	.35	- .36	- .31	- 35	.39	.64	.60	.63
Task **Importance**	49	- 40	- 48	- 46	.45	.76	.75	.83
Task **Significance**	36	- 41	- 37	- 44	.40	.62	.70	.71
Required **Skills**	- 18	52	22	53	- .19	- .40	- .36	- .44
Training **Adequacy**	44	- 17	- 39	01	.18	.41	.41	.47

AGMC Pearson Correlation Coefficients (Continued).

	Clarity	Difficulty	Results	Challenge	PDM	Freedom	Variety	Feedback
Rewards	02	12	- 10	- 23	.26	- .02	- .04	.04
Support for **Creativity**	29	- .14	- 24	- 38	.48	.22	.14	.23
Skills&Adeq **of Training**	- 36	05	31	06	- 23	- .29	- .25	- .32
Effort/Out **Probability**	07	11	- 05	- 14	.17	.14	.14	.14
Perform.ance **Constraints**	- 22	07	21	- 13	.03	.15	.22	.09
Past **Performance**	11	03	02	- 24	.15	.05	.05	.06
Modeling	15	- 01	- 19	- 26	.18	.20	.15	.23
Emotional **Arousal**	45	- 33	- 42	- 29	.38	.59	.52	.58
Verbal **Persuasion**	08	.16	- 01	- 12	.16	- 09	- 08	- .10
Empower.	40	- 14	- 35	- 38	.51	.56	.50	.52

AGMC Pearson Correlation Coefficients (Continued).

	Complet	Import	Signific	Skills	Adequac	Rewards	Creativ	Training
Task **Completeness**	1.00							
Task **Importance**	74	1.00						
Task **Significance**	54	74	1.00					
Required **Skills**	-.40	-.47	-.52	1.00				
Training **Adequacy**	29	41	.32	-.16	1.00			
Rewards	-.03	00	.00	02	-.11	1.00		
Support for **Creativity**	09	18	.15	-.13	.01	.55	1.00	
Skills&Adeq. **of Training**	-.22	-.27	-.20	05	-.64	-.24	-.21	1.00
Effort/Out **Probability**	02	.07	.12	-.03	-.07	.36	.27	-.11
Performance **Constraints**	12	.13	.15	-.06	.15	.10	.00	.09
Past **Performance**	04	.04	04	-.04	-.11	.27	34	-.09
Modeling	15	22	23	-.10	.01	.33	.40	-.18
Emotional **Arousal**	45	56	51	-.26	.45	.04	.23	-.39

AGMC Pearson Correlation Coefficients (Continued).

	Complet.	Import.	Signific.	Skills	Adequac.	Rewards	Creativ.	Training
Verbal **Persuasion**	08	-.15	-.03	09	-.12	.38	.38	-.05
Empower.	40	.51	.50	-.30	.30	.40	.54	-.43

	Probabil.	Constrain	Perform	Modeling	Arousal	Persuas.	Empower
Effort/Out. **Probability**	1.00						
Performance **Constraints**	21	1.00					
Past **Performance**	35	10	1.00				
Modeling	33	13	.45	1.00			
Emotional **Arousal**	05	-.14	.18	23	1.00		
Verbal **Persuasion**	37	00	.51	27	.06	1.00	
Empower.	36	25	34	42	.41	.24	1.00

Appendix C.

Table 11. Variables Impacting Supervision

GOAL CLARITY				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	22.90	5.82	5.07	78.12	.00
Supervisor	51	18.90	5.03			

GOAL DIFFICULTY				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	9.20	2.80	-3.62	63.60	.00
Supervisor	51	11.04	3.41			

JOB CHALLENGE				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super	265	10.49	3.39	-4.51	68.61	.00
Supervisor	51	12.92	3.56			

PDM				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	16.30	6.31	4.54	64.27	.00
Supervisor	51	11.22	7.51			

Table 11. (Continued)

FREEDOM				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	10.46	2.68	9.72	58.47	.00
Supervisor	51	4.65	4.11			

TASK VARIETY				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	9.50	2.03	10.50	56.67	.00
Supervisor	51	4.20	3.49			

TASK FEEDBACK				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	10.30	2.60	10.96	59.71	.00
Supervisor	51	4.32	3.73			

TASK COMPLETENESS				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	9.49	3.73	8.76	68.93	.00
Supervisor	51	4.31	3.89			

Table 11. (Continued)

TASK IMPORTANCE				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	11.00	2.67	10.79	58.54	.00
Supervisor	51	4.59	4.08			

TASK SIGNIFICANCE				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	10.28	3.13	8.01	59.27	.00
Supervisor	51	4.90	4.59			

REQUIRED SKILLS				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	6.95	2.68	-5.70	81.18	.00
Supervisor	51	8.94	2.20			

TRAINING ADEQUACY				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	16.95	4.02	5.71	72.22	.00
Supervisor	51	13.55	3.88			

Table 11. (Continued)

EMOTIONAL AROUSAL				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	10.22	2.52	6.00	60.76	.00
Supervisor	51	7.20	3.43			

VERBAL PERSUASION				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	3.73	1.56	6.00	60.76	.00
Supervisor	51	4.31	1.75			

EMPOWERMENT				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
Not a super.	265	44.31	9.26	-2.23	66.08	.03
Supervisor	51	35.16	18.89			

Table 12. Variables Impacting Grade

PDM				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
GS9 or less	93	15.28	6.93	1.65	196.30	.10
GS10 or more	153	13.76	7.02			

TRAINING ADEQUACY				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
GS9 or less	93	17.06	4.72	1.91	167.88	.06
GS10 or more	153	15.94	3.93			

REWARD				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
GS9 or less	93	16.42	6.14	3.45	191.22	.01
GS10 or more	153	13.65	6.02			

SUPPORT FOR CREATIVITY				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
GS9 or less	93	22.37	5.97	3.23	205.04	.00
GS10 or more	153	19.76	6.41			

Table 12. (Continued)

SKILL ADEQUACY				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
GS9 or less	93	7.24	2.07	-2.89	221.42	.00
GS10 or more	153	8.09	2.45			

PAST PERFORMANCE				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
GS9 or less	93	9.13	2.77	1.79	194.52	.08
GS10 or more	153	8.48	2.77			

EMOTIONAL AROUSAL				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
GS9 or less	93	8.95	3.40	-1.81	174.40	.07
GS10 or more	153	9.72	2.97			

EMPOWERMENT				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
GS9 or less	93	45.16	10.36	3.67	237.85	.00
GS10 or more	153	39.31	14.54			

Table 13. Variables Impacting Time in Service

JOB CHALLENGE			Separate variance estimate			
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
5yr or less	152	10.67	3.45	-1.72	299.77	.09
More 5yr	151	11.37	3.65			

PDM			Separate variance estimate			
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
5yr or less	152	16.82	5.94	4.12	288.44	.00
More 5yr	151	13.68	7.29			

FREEDOM			Separate variance estimate			
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
5yr or less	152	10.09	3.12	3.15	276.18	.00
More 5yr	151	8.74	4.22			

TASK VARIETY			Separate variance estimate			
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
5yr or less	152	9.11	2.41	3.06	259.01	.00
More 5yr	151	8.02	3.67			

TASK FEEDBACK			Separate variance estimate			
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
5yr or less	152	9.75	2.89	2.50	263.69	.01
More 5yr	151	8.70	4.27			

Table 13. (Continued)

TASK COMPLETENESS				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
5yr or less	152	9.04	3.81	1.99	288.78	.05
More 5yr	151	8.07	4.67			

TASK IMPORTANCE				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
5yr or less	152	10.40	3.04	2.50	262.16	.01
More 5yr	151	9.29	4.53			

TASK SIGNIFICANCE				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
5yr or less	152	9.93	3.40	2.85	278.07	.01
More 5yr	151	8.62	4.54			

PERFORMANCE CONSTRAINTS				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
5yr or less	152	4.05	1.84	2.12	299.36	.04
More 5yr	151	3.58	1.97			

Table 13. (Continued)

EMOTIONAL AROUSAL				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
5yr or less	152	10.05	2.37	2.28	269.33	.02
More 5yr	151	9.28	3.37			

EMPOWERMENT				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
5yr or less	152	44.31	8.48	2.68	237.56	.01
More 5yr	151	40.57	14.91			

Table 14. Variables Impacting Work Center

GOAL CLARITY				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
MA	72	19.11	6.56	-5.16	102.97	.00
All others	224	23.50	5.34			

KNOWLEDGE OF RESULTS				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
MA	72	8.39	2.98	4.03	120.40	.00
All others	224	6.76	2.99			

PDM				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
MA	72	14.56	6.86	-2.20	112.30	.03
All others	224	16.57	6.32			

FREEDOM				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
MA	72	8.54	4.02	-3.89	92.34	.00
All others	224	10.51	2.70			

TASK VARIETY				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
MA	72	7.49	3.39	-5.03	87.53	.00
All others	224	9.61	2.01			

Table 14. (Continued)

TASK FEEDBACK				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
MA	72	7.61	3.77	-6.17	91.77	.00
All others	224	10.54	2.50			

TASK COMPLETENESS				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
MA	72	8.04	4.13	-2.54	113.55	.01
All others	224	9.44	3.86			

TASK IMPORTANCE				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
MA	72	8.49	3.98	-5.30	92.61	.00
All others	224	11.15	2.68			

TASK SIGNIFICANCE				Separate variance estimate		
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
MA	72	8.47	4.17	-3.55	99.24	.00
All others	224	10.38	3.20			

Table 14. (Continued)

SKILLS			Separate variance estimate			
Group	n	Mean	S.d	T-value	d.f.	2-tail probability
MA	72	7.54	2.63	1.68	123.21	.10
All others	224	6.94	2.71			

TRAINING ADEQUACY			Separate variance estimate			
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
MA	72	15.32	4.22	-3.08	115.71	.00
All others	224	17.07	4.03			

EMOTIONAL AROUSAL			Separate variance estimate			
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
MA	72	9.00	3.15	-3.12	101.42	.00
All others	224	10.27	2.51			

EMPOWERMENT			Separate variance estimate			
Group	n	Mean	S.d.	T-value	d.f.	2-tail probability
MA	72	41.00	12.88	-2.29	94.57	.02
All others	224	44.75	9.05			

Appendix D.

GENERAL INFORMATION

The purpose of this questionnaire is to obtain information about you, your job, your work group and your organization. Specifically, this information is being collected in support of research assessing employee attitudes toward different aspects of their work environment.

Please be assured that all information you provide will be held in strictest confidence. Your individual responses will NOT be provided to management or to any other agency. The pre-coded numbers "1" and "2" in the "IDENTIFICATION NUMBER" section of the response forms merely divide the questionnaire into two sets of questions. Feedback on the study's results will be presented to management only in terms of group averages describing what the "typical" employee would say. In addition, when the results of this study are published, readers will NOT be able to identify specific individuals or groups.

Thank you for your cooperation in participating in this study. If you have any questions, please contact the researcher at the following address:

Kenneth R. Jennings, PhD
Wright-Patterson AFB OH 45433
Telephone: AUTOVON 785-4435

KEYWORDS

The following are definitions of key words that you will see throughout the questionnaire.

1. Supervisor: The person to whom you report directly.

2. Work Group: All persons who report to the same supervisor that you do. If you are a supervisor, your work group is the group of employees that report directly to you.

3. Organization:

INSTRUCTIONS

This questionnaire contains 144 items (individual "questions"). The questionnaire booklet is broken into two parts. The first part contains the first 80 items in this booklet, and the second part contains the remaining 64 items. All items must be answered by filling the appropriate spaces on the machine-scored answer sheets provided. If for any item you do not find an answer that fits your situation exactly, use the one that is closest to the way you feel. There are no right or wrong answers.

Please use a "soft-lead" (No. 2) pencil, and observe the following:

1. Make heavy black marks that fill the space of the answer you select.

2. Erase cleanly any answers you wish to change.

3. Make no stray markings of any kind on the answer sheet.

4. Do not staple, fold or tear the answer sheet.

5. Do not make any markings on the questionnaire booklet.

You have been provided with two answer sheets. DO NOT fill in your name or social security number on either sheet. This way your answers will be anonymous. Please note that both sheets have been pre-coded in the "IDENTIFICATION NUMBER" section with either a "1" or "2". Please use the answer sheet with the number "1" to respond to the first 80 items of Part I

of the survey. Answer the remaining 64 items in Part II on the answer sheet with the pre-coded number "2".

Each answer block has ten spaces (numbered 1 through 10) or a 1-10 scale. The questionnaire items normally require an answer from 1-7 only, therefore, you will rarely need to fill a space numbered 8, 9, or 10. Questionnaire items are answered by marking the appropriate space on the answer sheet as in the following example:

SCALE:

1 = Strongly disagree
2 = Moderately disagree
3 = Slightly disagree
4 = Neither agree or disagree
5 = Slightly agree
6 = Moderately agree
7 = Strongly agree

Sample Item 1:

The guidance you receive in your job from your supervisor is frequently unclear.

(If you "moderately agree" with the sample item #1, you would "blacken in" the corresponding number of that statement (moderately agree = 6) on the answer sheet for the item numbered "sample item 1.")

Sample answer: 1 2 3 4 5 6 7 8 9 10

Take your time in answering the following questions. If you have any questions, please feel free to talk with the person administering the questionnaire.

Part I

BACKGROUND INFORMATION

This section of the questionnaire contains several items dealing with personal characteristics. This information will be used to obtain a picture of the background of the "typical employe."

1. Your age is:

    1. Less than 20
    2. 20 to 25
    3. 26 to 30
    4. 31 to 40
    5. 41 to 50
    6. 51 to 60
    7. More than 60

2. Your highest education level obtained was:

    1. Non high school graduate
    2. High school graduate or GED
    3. Some Technical or Trade school
    4. Some college work
    5. Associate's degree
    6. Bachelor's degree
    7. Some graduate work
    8. Master's degree
    9. Doctoral degree

3. Your sex is:

    1. Male
    2. Female

4. Your pay grade :

1. WG 1-3
2. WG 4-6
3. WG 7-9
4. WG10-12
5. GS 1-3
6. GS 4-6
7. GS 7-9
8. GS 10-12
9. Other: (please specify)_____

5. Total months in this organization:

1. Less than 1 year
2. More than 1 year, less than 5 years
3. More than 5 years, less than 10 years
4. More than 10 years, less than 15 years
5. More than 15 years, less than 20 years
6. More than 20 years, less than 25 years
7. More than 25 years, less than 30 years
8. More than 30 years

6. How many people do you directly supervise (i.e., those for which you write performance reports)?

1. None
2. 1 to 2
3. 3 to 5
4. 6 to 8
5. 9 to 12
6. 13 to 20
7. 21 or more

7. How much Process Action Team or Quality "classroom" or "formal" training have you had on the job while at AGMC?

1. None
2. 1-16 hours
3. 17 or more hours

8. I have belonged to an AGMC Process Action Team for:

1. 1-3 months
2. 4-6 months
3. 7-9 months
4. 10-12 months
5. 13-15 months
6. 16-18 months
7. 19-21 months
8. 22-24 months
9. more than 24 months

9. My work center at AGMC is:

1. DS
2. MA
3. SC
4. XP
5. ML
6. 2803 ABG

WORK GOALS

The following statements deal with your understanding of the nature of goals and objectives that guide your work. Use the rating scale given below to indicate the extent to which your work goals have the characteristics described.

1 = Strongly disagree
2 = Moderately disagree
3 = Slightly disagree
4 = Neither agree or disagree
5 = Slightly agree
6 = Moderately agree
7 = Strongly agree

10. I know exactly what is expected of me in performing my job.

11. I understand clearly what my supervisor expects me to accomplish on the job.

12. What I am expected to do at work is clear.

13. I understand the priorities associated with what I am expected to accomplish on the job.

14. It takes a high degree of skill on my part to attain the results expected for my work.

15. Results expected in my job are very difficult to achieve.

16. I must work hard to accomplish what is expected of me for my work.

17. I usually know whether or not my work is satisfactory on this job.

18. I seldom know whether I'm doing job well or poorly.

19. To be successful on my job requires all my skill and ability.

The responses are:

1 = Strongly disagree
2 = Moderately disagree
3 = Slightly disagree
4 = Neither agree or disagree
5 = Slightly agree
6 = Moderately agree
7 = Strongly agree

20. On my job, I seldom get a chance to use my special skills and abilities.

21. My job is very challenging.

WORK ATTITUDES

This section contains a number of statements that relate to feelings about your work group, the demands of your job, and the supervision you receive. Use the following rating scale to indicate the extent to which you agree or disagree.

1 = Strongly disagree
2 = Moderately disagree
3 = Slightly disagree
4 = Neither agree or disagree
5 = Slightly agree
6 = Moderately agree
7 = Strongly agree

22. Within my work-group, the people most affected by decisions frequently participate in making the decisions.

23. In my work-group there is a great deal of opportunity to be involved in resolving problems which affect the group.

24. I am allowed to participate in decisions regarding my job.

25. I am allowed a significant degree of influence in decisions regarding my work.

26. My supervisor usually asks for my opinions and thoughts in decisions regarding my work.

JOB CHARACTERISTICS

The next questions ask you to describe the the JOB ON WHICH YOU WORK. Please do not try to show how much you like or dislike your job; just try to be as accurate and factually correct as possible. Use the following rating scale to indicate the extent to which you agree or disagree with the statements shown below.

1 = Never
2 = Very Rarely
3 = Rarely
4 = Sometimes
5 = Often
6 = Very Often
7 = Always

27. I have the freedom to decide what I do on my job.

28. It is basically my own responsibility to decide how my job gets done.

29. I get to do a number of different things on my job.

30. My job requires that I do the same thing over and over.

31. As you do your job, you can tell how well you are performing?

32. Just doing the work required by my job gives me many chances to figure out how well I am doing.

33. How much does your job involve your producing an entire product or an entire service?

34. On my job I produce a whole product or perform a complete service.

35. How much does the work you do on your job make a visible impact on a product or service?

36. I can see the results of my own work.

Remember, in answering these questions the rating scale is:

1 = Never
2 = Very Rarely
3 = Rarely
4 = Sometimes
5 = Often
6 = Very Often
7 = Always

37. A lot of people can be affected by how well I am doing my work.

38. In general, how *significant* or *important* is your job; that is, are the results of your work likely to significantly affect the lives or well-being of other people?

39. My job is so simple that virtually anybody could handle it with little or no training.

40. It takes a long time to learn the skills required to do my job well.

41. I do not have enough training to do my job well.

42. I have all the skills I need in order to do my job.

43. I have more than enough training and skills to do my job well.

SUPERVISION

For these questions, use the scale below to answer the responses that BEST describes your opinions.

1 = Never
2 = Very Rarely
3 = Rarely
4 = Sometimes
5 = Often
6 = Very Often
7 = Always

44. I find my supervisor pleasant.

45. I find my supervisor cold.

46. I find my supervisor considerate.

47. I find my supervisor not supportive.

48. I find my supervisor accepting.

49. I find my supervisor nice.

50. I find my supervisor gloomy.

51. I find my supervisor quarrelsome.

52. I find my supervisor friendly.

53. I find my supervisor kind.

54. I find my supervisor not understanding.

55. I find my supervisor helpful.

56. My supervisor seems very familiar with the details of my job.

57. I trust my supervisor's ability to supervise my job.

Responses to these questions are:

1 - Never
2 - Very Rarely
3 = Rarely
4 = Sometimes
5 = Often
6 = Very Often
7 = Always

58. I have full confidence in my supervisor.

59. I find it more relaxing when my supervisor is present in my office/shop.

60. Generally, I am more committed to my job/task when my supervisor is present in my office/shop.

JOB ATTITUDES-1

Here are some more questions about your present job or work. Use the following rating scale to express your feelings about your present job or work.

1 = Never
2 = Very Rarely
3 = Rarely
4 = Sometimes
5 = Often
6 = Very Often
7 = Always

61. I have the knowledge and skills to complete my job to my satisfaction.

62. I am certain I can compete my job to my satisfaction.

63. If I discovered a bottleneck in my shop's work, I would be able to get it changed.

64. I feel like I can be a complete person here at work.

65. I am comfortable trying to solve problems in new ways.

66. I have the power to change things where I work.

67. I have control over my work.

68. I am powerless to change anything where I work.

69. Based on previous performance and current knowledge of my present job, I can achieve more difficult goals if I so desire.

For the next two questions, consider being promoted to a different job with which you have little or no experience. This new job is in the same office where you now work.

70. With little or no experience, I feel I could do a proportional amount of work as someone with more experience.

71. With little or no experience, I believe I could achieve the goals that have been set.

Now consider being promoted to a different job and location. You again have little or no experience in this new job. Remember, the responses are:

1 = Never
2 = Very Rarely
3 = Rarely
4 = Sometimes
5 = Often
6 = Very Often
7 = Always

72. With little or no experience, I feel I could do a proportional amount of work as someone with more experience.

73. I feel I could accomplish the established goals.

74. I could commit to those goals which I feel I could meet.

75. It would be difficult for me to commit to a set of goals if I believed them to be too difficult to achieve.

76. I am more apt to perform at the same level as my co-workers.

77. Generally, I perform to the best of my ability regardless of my co-workers' performance.

78. I fully accept the group's goals as my own.

79. The group's goals have no influence on my personal goals.

80. I'm committed to achieving the goals of my group.

You are now finished completing the first section of the questionnaire. Please answer the following questions on the answer sheet with the pre-coded number "2" in the "IDENTIFICATION NUMBER" area.

Please use the answer sheet with the pre-coded number "2" in the "IDENTIFICATION NUMBER" area to answer the following questions.

PART II

Use one of the following responses in answering each question:

1 = Never
2 = Very Rarely
3 = Rarely
4 = Sometimes
5 = Often
6 = Very Often
7 = Always

1. Regardless of other interactions with my supervisor, I had a major influence on the goals that were set.

2. Compared to my supervisor, I have no influence over the goals that were set.

3. Regardless of other interactions, compared to my supervisor, I have the most say in determining the goal(s).

For the next three questions, consider that the task/job of you and your co-workers required multiple shifts, or multiple groups on the same shift, or perhaps, several people on the same shift doing similar tasks. The responses remain the same.

4. I would be more committed to the goals if my performance was measured against the worker(s) doing the same task on a different shift.

5. I would be more committed to my job if my group's performance was measured against the work of another group's performance.

6. If my performance was being measured against the work of another co-worker, I would try to out-perform that worker.

JOB ATTITUDES-2

Empowerment is belief that you *can* do what you set out to do. An **empowered** person has both the ability and the power to complete a task. Use the rating scale given below to indicate the level of **empowerment** where you work.

1 = Never
2 = Very Rarely
3 = Rarely
4 = Sometimes
5 = Often
6 = Very Often
7 = Always

7. I am empowered to do everything I need to do on my job.

8. I now have skills I never knew I had.

9. Watching and learning from other people has helped me do my job.

10. My previous performance leads me to believe I can now complete work I never used to be able to do.

11. I am empowered to take situations at work into my own hands.

12. People in my organization are empowered.

13. My supervisor has convinced me that I can complete tasks I previously did not think I could.

14. I am empowered to solve problems I encounter on the job in different ways.

15. I can now accomplish tasks at work I never thought I'd be able to do.

16. My managers and supervisors empower me to do all the tasks I need to do.

WORK ATMOSPHERE

The next questions ask you to describe the the JOB ON WHICH YOU WORK. Please do not try to show how much you like or dislike your job; just try to be as accurate and factually correct as possible. Use the following rating scale to indicate the extent to which you agree or disagree with the statements shown below.

1 = Never
2 = Very Rarely
3 = Rarely
4 = Sometimes
5 = Often
6 = Very Often
7 = Always

17. This organization is always moving toward the development of new answers.

18. Around here people are allowed to try to solve the same problem in *different* ways.

19. Creativity is encouraged here.

20. People in this organization are always searching for fresh, new ways of looking at problems.

21. The leadership acts as if we are not very creative.

22. We're always trying out new ideas.

23. This organization is open and responsive to change.

24. People here try new approaches to tasks, as well as tried and true ones.

25. I have all the skills I need in order to do my job.

26. I do not have enough training and skills to do my job well.

27. If I only try harder, I can do what is expected of me at work.

REWARDS

Here are some things that could happen to people when they do their jobs especially well. How likely is it that each of these things would happen if you performed your job especially well? Use any number from 1 to 4 to indicate your response.

1 = Not at all likely
2 = Somewhat likely
3 = Quite likely
4 = Extremely likely

28. You will get a pay increase.

29. You will feel better about yourself as a person.

30. You will have an opportunity to develop your skills and abilities.

31. You will be given chances to learn new things.

32. You will be promoted or get a better job.

33. You will get a feeling that you've accomplished something worthwhile.

Here are some more questions about rewards you receive on the job. Use the responses below to answer the following questions:

1 = Never
2 = Very Rarely
3 = Rarely
4 = Sometimes
5 = Often
6 = Very Often
7 = Always

34. My supervisor has the power to reward my performance.

35. It makes me feel good when my supervisor publicly praises my performance.

36. I am more committed to my job/task when my supervisor publicly praises my performance.

37. It makes me feel good when my supervisor privately praises my performance.

38. Private recognition helps me be more committed to my job.

39. Regardless of how praise or recognition is given, I am more committed to my job when my supervisor recognizes my performance.

40. Consider the likelihood of favorable or unfavorable consequences of goal attainment in terms of job security, future pay increases or promotions, co-worker respect, etc. In general, I think it would be advantageous to attain the overall goal.

Consider the possibility of an incentive program where specified bonuses were offered for exceeding reasonable, obtainable goals. (For example, x dollars for just exceeding the goals, 2x dollars for exceeding the goal(s) by a few more).

41. I have a good chance of receiving the bonus pay.

42. I would try harder to achieve the goal necessary to receive the extra pay.

Possible answers are:

1 = Never
2 = Very Rarely
3 = Rarely
4 = Sometimes
5 = Often
6 = Very Often
7 = Always

43. I would try to achieve the next higher goal (next higner bonus pay) if I were achieving a smaller bonus payment.

44. Regardless of how hard I try, I could never achieve the bonus pay.

45. Regardless of the feedback program, I have my own method of tracking my performance relative to the organizational goals.

46. I reward myself when I achieve the goals set by my organization.

47. My personal reward system is more effective in getting me committed to the organizational goals than the organizational reward system.

48. My personal reward system is adapted from the organizational reward system.

49. My personal reward system has little or nothing in common with the organizational reward system.

50. My personal reward system enhances my own commitment to the organizational goals.

PERFORMANCE OBSTACLES AND CONSTRAINTS

The following items deal with obstacles and constraints that you may encounter in your work which inhibit good performance. For example, one salesperson might exceed the performance of another simply because he or she was lucky enough to get a lucrative territory. For the unlucky salesperson, the less desirable territory is an "obstacle" for him or her to overcome. Performance obstacles are often factors "beyond one's control" that inhibit (or enhance) maximum job performance. Use the rating scale below to indicate how frequently each performance obstacle or constraint poses a problem for you.

1 = Never
2 = Very Rarely
3 = Rarely
4 = Sometimes
5 = Often
6 = Very Often
7 = Always

51. Job Induced Constraints (factors in the actual make-up of the job itself such as machine breakdown, inadequate tools and supplies, etc.)

52. Communication Obstacles (restrictions in communicating with others important to getting your job done.)

53. Administrative or Policy Constraints (actions or attitudes of your immediate work group that make it harder to do a good job.)

54. Supervisor Constraints (actions or attitudes of your immediate supervisor that make it harder to do a good job.)

JOB ATTITUDES-3

The following questions deal with the AFLC quality program. Please use the following scale in responding:

1 = Not at all
2 = Somewhat less
3 = Equal
4 = Somewhat greater
5 = Practically all

55. To what extent do you know what is expected of you individually under the AFLC quality program?

56. To what extent have you personally changed what you do day-to-day as a result of the AFLC quality program?

57. When you have a choice on how to do your work, to what extent do you perform it using AFLC quality techniques or approaches?

58. When your entire work group has a choice on how to perform their work, to what extent do they perform it using AFLC quality techniques or approaches?

59. To what extent do you think quality is important for its own sake?

60. In your opinion, to what extent is quality a way of life in your organization?

61. To what extent do you think senior management is committed to making quality a way of life?

THIS COMPLETES THE QUESTIONNAIRE. COULD YOU PLEASE ANSWER THESE FINAL THREE QUESTIONS?

62. What did you think about the length of this questionnaire?

1. Much too long.
2. Somewhat too long.
3. Just about right.
4. Somewhat too short.
5. Much too short.

63. How seriously did you answer the questions?

1. Not at all seriously.
2. A little seriously.
3. Somewhat seriously.
4. Quite seriously.
5. Very seriously.

64. How much did you enjoy taking this questionnaire?

1. Not at all pleasant, enjoyable or fun.
2. A little enjoyable.
3. Somewhat enjoyable.
4. Quite enjoyable.
5. Extremely pleasant, enjoyable and fun.

We appreciate your cooperation in spending time to answer our questions. If you have any comments on this study or other issues here in this organization, please feel free to use the space below for that purpose.

Once again, thank you.

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[redacted]

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION: UNCLASSIFIED	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION / AVAILABILITY OF REPORT: Approved for public release; distribution unlimited
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S): AFIT/GLM/LSR/89S-36	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION: School of Systems and Logistics; 6b. OFFICE SYMBOL (If applicable): AFIT/LSM	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code)	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING / SPONSORING ORGANIZATION; 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS: PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO / WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)

EMPOWERMENT: A STRATEGY FOR INCREASED QUALITY IN AIR FORCE LOGISTICS COMMAND

12. PERSONAL AUTHOR(S)
Michael J. Krimmer, B.A., MPA, Maj, USAF

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
MS Thesis	FROM _____ TO _____	1989 September	132

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	
05	08		Empowerment Quality TQM Managerial Strategies

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

Thesis Advisor: Kenneth R. Jennings

Associate Professor

Department of Communication and Organizational Sciences

Approved for public release: IAW AFR 190-1.

Larry W. Emmelhainz

LARRY W. EMMELHAINZ, Lt Col, USAF 14 Oct 89
Director of Research and Consultation
Air Force Institute of Technology (AU)
Wright-Patterson AFB OH 45433-6583

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION	
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	UNCLASSIFIED	
22a. NAME OF RESPONSIBLE INDIVIDUAL: Kenneth R. Jennings, Assoc. Professor	22b. TELEPHONE (Include Area Code): (513) 255-4435	22c. OFFICE SYMBOL: LSR

DD Form 1473, JUN 86 — Previous editions are obsolete.

Abstract

The purpose of this study was to develop both an analytical model describing, and an instrument to measure, the behavioral construct empowerment. The pressing importance of such a model and an instrument to measure this construct, is evident in AFLC's Quality Initiative and in the more widespread perception that American management must change dramatically to restore, or at least regain, the favorable reputation American products and services once enjoyed both at home and abroad.

The study provides a brief background on the concepts of self-efficacy and empowerment, detailing their evolution in the psychological and managerial literature. Next follows a proposed model of the empowerment process and an instrument to test the model and measure levels of empowerment among a firm's employees. A discussion of the reliability and validity of both the instrument and the model follows, with attendant analysis of results and conclusions. The study closes with recommended managerial actions to further increase empowerment among an organization's employees.